

ACTIVITY BASED SAMPLING SUMMARY REPORT

WORKER RECEPTORS

LIBBY, MONTANA OPERABLE UNIT 6

LIBBY, MONTANA

Prepared For:



The BNSF Railway Company
825 Great Northern Boulevard, Suite 105
Helena, Montana



Prepared By:

March 12, 2010

Project #: 5539-120



11 E. Superior St
Suite 260
Duluth, MN 55802
P: 218.625.2332
F: 218.625.2337
www.emr-inc.com

EXECUTIVE SUMMARY

The following document has been prepared to summarize the methods used and results of an Activity Based Sampling (ABS) event conducted in September 2008 at the request of the U.S. Environmental Protection Agency (EPA).

The ABS event was designed to evaluate potential exposure to two populations: BNSF Railway Company (BNSF) Maintenance of Way (MOW) workers (Workers) and the general public (Public). This report will focus on the sampling and results conducted on Worker population. Sampling and results of the Public assessment will be published under separate cover.

INTRODUCTION

The Libby asbestos site has been on the National Priorities List since 2002 and encompasses the towns of Libby and Troy, Montana, the former W.R. Grace mine-site and several other Operable Units (OU). Property owned by the BNSF Railway Company (BNSF) has been designated OU6 and is defined geographically by the BNSF property boundaries and extent of contamination associated with the railyard and other Right of Way (ROW). Generally OU6 is as wide as the ROW (CDM, 2008) with the western and eastern limits being defined by limits of OU7 and OU4, respectively (Figure 1).

In preparation for the 2008 ABS event the following documents were prepared to govern the sampling, analysis and safety aspects of the project:

- Worker Receptor Sampling and Analysis Plan (Worker SAP) (AECOM, 2008a);
- Public Receptor Sampling and Analysis Plan (Public SAP) (AECOM, 2008b);
- Project-specific Health and Safety Plan (HSP) (EMR, 2008); and
- SAP analytical summaries.

Collectively these documents served to provide guidance in the collection and analysis of samples and to govern health and safety procedures. The focus of this report will be methods and procedures defined in the Worker SAP.

SAMPLING AND ANALYTICAL

Personal air samples were collected from Workers to evaluate their potential exposure risk during rail maintenance activities. Camp, Dresser and McKey (CDM) personnel provided sampling oversight on behalf of the EPA.

All air samples were submitted to CDM for analysis by EMSL Analytical, Inc. (EMSL) utilizing ISO 10312 methods.



RESULTS

A total of 12 Worker personal air samples were collected during the ABS event. All but three (3) samples (BA-00002, BA-00037, and BA-000038) met the target analytical sensitivity of 0.0024 structures/cubic centimeter. All worker air samples were non-detect for LA, Other Amphibole (OA) and Chrysotile.

A total of 8 blank samples were collected and submitted for analysis. Three of the blanks were not analyzed at the discretion of EMSL and were archived. All of the blanks were non-detect.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
INTRODUCTION	i
SAMPLING AND ANALYTICAL	i
RESULTS	ii
LIST OF TABLES	v
LIST OF FIGURES	v
LIST OF APPENDICIES	v
LIST OF ACRONYMS	vi
1.0 SITE LOCATION	1
2.0 ABS PREPARATION	2
2.1 ABS Documents	2
2.1.1 Public Receptor Sampling and Analysis Plan	2
2.1.2 Health and Safety Plan	2
2.1.3 SAP Analytical Summaries	2
2.2 Site Specific Procedures	2
2.3 Personal Air Sampling Methods and Equipment	3
2.4 Sample Identification Numbers	3
3.0 DOCUMENTATION PROGRAM	4
3.1 Field Notes	4
3.2 Field Sample Data Sheets	4
4.0 SAMPLE ANALYSIS	5
4.1 Analytical Methods	5
4.1.1 TEM Analysis	5
5.0 SAMPLING PROGRAM	7
5.1 Sampling Areas	7
5.2 Deviations from SAP	7
5.3 Worker Air Sampling	8
5.4 Sample Identification Numbers	8
6.0 SAMPLING SUMMARY	9
6.1 September 17, 2008	9



6.2 September 18, 2008.....	9
6.3 September 19, 2008.....	9
6.4 September 22, 2008.....	9
6.5 September 23, 2008.....	10
6.6 September 24, 2008.....	10
6.7 September 25, 2008.....	10
7.0 DISCUSSION OF RESULTS	11
7.1 Worker Personnel Air Sampling Results	11
7.2 Air Sample Blank Results.....	11
8.0 REFERENCES	12
9.0 STANDARD OF CARE	13

LIST OF TABLES

Table 1. Summary of ABS Air Sampling Results

Table 2. Summary of Soil Sampling PLM-VE (Fine Fraction) Results

Table 3. Summary of Soil Sampling PLM-Gravimetric (Coarse Fraction) Results

LIST OF FIGURES

Figure 1. Site Location Map

Figure 2. OU6 Overview Map Showing Commonly Referenced Features

Figure 3. Daily Sampling Area Map

LIST OF APPENDICIES

Appendix A. Analytical Summaries

Appendix B. Field Notes

Appendix C. Field Sampling Data Sheets – Air

Appendix D. Field Change Orders

Appendix E. Worker Air Sample Laboratory Reports

LIST OF ACRONYMS

ABS – Activity Based Sampling
BNSF – BNSF Railway Company
C – Chrysotile
CDM – Camp, Dresser and McKee
EMSL – EMSL Analytical, Inc
EPA – U.S. Environmental Protection Agency
FCO – Field Change Order
FSDS – Field Sampling Data Sheets
HSP – Health and Safety Plan
ISO – International Organization for Standardization
L/m – Liters per minute
LA – Libby Amphibole
MCE – Mixed Cellulose Ester
MOW – Maintenance of Way
MP – Mile Post
NIOSH – National Institute for Occupational Safety and Health
OA – Other Amphibole
OU6 – Operable Unit 6
PCM – Phase Contrast Microscopy
PPE – Personal Protective Equipment
QA/QC - Quality Assurance/Quality Control
ROW – Right of Way
RP – Rail Production
s/cc – Structures per cubic centimeter
SAP – Sampling and Analysis Plan
SOP – Standard Operating Procedure
TEM – Transmission Electron Microscopy

1.0 SITE LOCATION

The Libby asbestos site has been on the National Priorities List since 2002 and encompasses the towns of Libby and Troy, Montana, the former W.R. Grace mine-site and several other Operable Units (OU). Property owned by the BNSF Railway Company (BNSF) has been designated OU6 and is defined geographically by the BNSF property boundaries and extent of contamination associated with the railyard and other Right of Way (ROW).

In general, OU6 is as wide as the ROW (CDM, 2007). Although no formal geographic boundaries have been established for the western or eastern limits of OU6, EPA's agent, Camp, Dresser and McKee (CDM) has used the limits of OU4 to define the east side boundary and the limits of OU7 defined the west side boundary (Figure 1) (CDM, 2007). These limits roughly correlate to BNSF Mile Post (MP) 1301.5 on the east to MP 1342 on the west (Figure 2).

OU6 is encompassed by BNSF's Kootenai River Subdivision that extends westward from Whitefish, Montana to Sandpoint, Idaho. Approximately 40 trains per day pass over the Kootenai River Subdivision. The portion of the Kootenai River subdivision within OU6 is single track with passing sidings that allow the passing of trains traveling in opposite directions. Passing sidings within OU6 are located at following locations (from east to west) (Figure 2):

- Riverview (MP 1306.9)
- Ripley (MP 1312.2)
- Libby (MP 1319.6)
- Kootenai Falls (MP 1331.3)
- Troy (MP 1337.9)

Two small railyards are present at Libby and Troy (Figure 2) and an industrial spur is present at the east end of Libby. From MP 1301.5 to approximately 1307.5 the BNSF ROW parallels Fisher River and then follows the Kootenai River from 1307.5 to the west end of OU6 (Figure 2).

2.0 ABS PREPARATION

2.1 ABS Documents

In preparation for the 2008 Activity Based Sampling (ABS) event, a series of documents were prepared to govern the sampling, analysis and safety aspects of the project. The following is a brief description of purpose of each document that pertains to the Worker Receptor portion of the ABS event.

2.1.1 PUBLIC RECEPTOR SAMPLING AND ANALYSIS PLAN

The Worker Receptor Sampling and Analysis Plan (Worker SAP) (AECOM, October, 2008a) detailed the methods and procedures that were utilized during the collection of personal air samples of BNSF Maintenance of Way (MOW) workers. The focus of the Worker SAP was to assess the potential exposure of BNSF workers to airborne Libby Amphibole (LA) during rail maintenance activities.

2.1.2 HEALTH AND SAFETY PLAN

A project-specific Health and Safety Plan (HSP) was developed to cover safety and Personal Protective Equipment (PPE) issues for personnel involved with the sampling activities (EMR, 2008). The HSP was not developed as a site specific plan since the work sites would be changing daily. In addition to the HSP, all sampling personnel attended daily BNSF safety briefing that included job specific details including planned work activities, area specific hazards and weather forecasts.

2.1.3 SAP ANALYTICAL SUMMARIES

A SAP analytical summary was developed for samples collected under the Worker SAP. The analytical summary was approved by the EPA, EPA agents and contracted laboratories. The purpose of the analytical summary was to condense the analytical parameters specified in the Worker SAP into an easily referenced guide for the laboratory. The approved Worker Receptor analytical summary is included in Appendix A.

2.2 Site Specific Procedures

Prior to initiating ABS sampling, EMR field staff received training from CDM on Field Sample Data Sheet (FSDS) procedures that are specific to the Libby Superfund Site. The FSDS training did not follow a specific Standard Operating Procedure (SOP), but rather focused on the procedures to be followed for completion of FSDS forms and the submission of air and soil samples for analysis.



2.3 Personal Air Sampling Methods and Equipment

Personal air samples were collected to evaluate air quality for BNSF workers (Workers). Two Worker personal air samples were collected each work day to evaluate potential exposure of BNSF maintenance workers to fiber releases. The samples were split between machine operator and laborer positions within the gang.

Personal air samples were collected using Gillian BDX II personal air pumps equipped with Zefon 25mm Phase Contrast Microscopy (PCM) cassettes with 0.8 μ m Mixed Cellulose Ester (MCE) filters. Personal air samples were collected at flow rates that ranged between 1.4 Liters/minute (L/m) and 2.8 L/m, as determined by testing with a calibrated rotameter at the beginning and ending of the day. These cassettes were utilized for both PCM analysis by National Institute for Occupational Safety and Health (NIOSH) Method 7400 and Transmission Electron Microscopy (TEM) analysis by the International Organization for Standardization (ISO) Method 10312. All personal air samples requiring fixed laboratory analysis were submitted to CDM for analysis by EMSL Analytical, Inc (EMSL). Copies of the FSDSs for the Worker Receptor personal air samples are found in Appendix B.

It should be noted that additional matrices were sampled and other data, including meteorological data and field notes, was gathered during the ABS event. In order to avoid redundancies, these additional data sets are discussed in the *2008 Activity Based Sampling Summary Report – Public Receptors* (EMR, 2009).

2.4 Sample Identification Numbers

All samples were assigned a unique sample identification consisting of a prefix followed by a five digit number that signify the order in which the samples were collected. All sample identifications were pre-assigned by CDM. Air samples were designated by a BA prefix while the Location IDs used during the collection of air samples (AD-005568) were also assigned by CDM.



3.0 DOCUMENTATION PROGRAM

3.1 Field Notes

Two sets of field notes were collected by EMR personnel, one maintained by the soil sampling crew while the other was maintained by personnel outside the work area. These notes apply to both the Worker and Public Receptor portions of the ABS event and contain details regarding general field conditions, sample location information, soil descriptions, and timing of work completed. All notes were kept in bound field books and copies are found in Appendix B.

3.2 Field Sample Data Sheets

Information for each sample collected was logged on FSDSs that were provided by CDM. Three types of FSDSs were provided by CDM: 1) personal air samples; 2) stationary air samples; and 3) soil samples. FSDSs were completed by EMR personnel using CDM-assigned sample numbering labels as well as sample specific data. Personal air sample FSDSs are found in Appendix B.

Additional documentation of field events and sampling conditions was collected during the ABS event. In order to avoid redundancies, these additional data sets are discussed in the *2008 Activity Based Sampling Summary Report – Public Scenario* (EMR, 2010).

4.0 SAMPLE ANALYSIS

4.1 Analytical Methods

All samples collected during the ABS event were submitted to the CDM Libby, Montana office. After approval of the analytical summary sheets, CDM generated chain of custody forms and submitted all Worker air samples to EMSL's Libby, Montana laboratory. The following is a brief discussion of the analytical methods used in the analysis of the ABS samples.

4.1.1 TEM ANALYSIS

Worker air samples were submitted for TEM analysis using the International Organization for Standardization (ISO) 10312 methodology. This method determines and counts the type(s) of asbestos structure present, but sometimes cannot discriminate between individual fibers of amphibole and non-asbestos analogues of the same amphibole mineral. The method categorizes structures of various lengths and widths into "bins" to count the various fractions of Libby Amphibole (LA), Other Amphibole (OA) and Chrysotile (C). The method specifies six bins that are characterized as follows:

- Bin A: All LA, OA and C fibers with a length to width aspect ratio less than 5:1;
- Bin B: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1 and length less than 0.5 μm ;
- Bin C: All LA, OA and C fibers with an a length to width aspect ratio greater than or equal to 5:1 and width less than or equal to 0.5 μm ;
- Bin D: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1, with fiber length between 0.5 μm and 5 μm ;
- Bin E: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1, length between 5 and 10 microns and width less than or equal to 0.5 μm ; and
- Bin F: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1, length greater than 10 μm and width less than or equal to 0.5 μm .

Results are expressed in units of structures per cubic centimeter (s/cc) (Table 1).

A total of 4 worker air samples required indirect preparation methods due to overloading of the sample filter. All other samples were directly prepared.

Overloading can be caused by a number of environmental factors including the intake of high concentrations of natural airborne dust, high concentrations of airborne pollen or seeds and clothing fibers. The purpose of indirect preparation is to remove any organic material that was recovered during the sampling process to allow for accurate analysis of the sample. Indirect preparation includes the following steps:



- Organic materials (including the filter) are oxidized (ashed) using a plasma oxidation chamber;
- the materials that survive the oxidation process are re-suspended in water and then re-deposited on a new filter;
- The new filter is analyzed using the same methods as a direct preparation sample.

5.0 SAMPLING PROGRAM

5.1 Sampling Areas

EMR personnel consulted with the BNSF Rail Production (RP) -15 and RP-21 Roadmasters on a daily basis to determine the planned activities and the exact work area in which sampling would take place. On several days a particular gang and its personnel would complete multiple projects. Since Worker sampling was initiated at the beginning of the work day and continued until the end, Worker data represents the conditions throughout a work day instead of a specific project.

5.2 Deviations from SAP

The ABS event was conducted in accordance with the procedures described in the Worker SAPs except when field conditions warranted a deviation. The following is a discussion of deviations from the Worker SAP that were incorporated into the sampling process based on field conditions. All deviations were documented on Field Change Order (FCO) forms and those that apply to the Worker SAP are discussed below and are found in Appendix C. Many of the deviations resulted from determining actual field conditions versus those speculated during the SAP development.

- FCO #17-1: A flow rate of 5 L/m could not be achieved with the personal pumps. Reduced flow rates increased the duration of sampling events from 4 hours to 8 hours.
- FCO #17-3: The SAP assumed that no train traffic would pass through the sampling area. On day 1 train traffic was allowed to pass through the sampling area during maintenance and sampling activities. All subsequent trains passing through the sampling area were recorded in the field book.
- FCO #17-6: Worker sampling event duration is variable and is not under the control of the sampling team. The SAP called for maximum sample duration of 4 hours for workers. Pumps were placed on workers at the beginning of a shift and retrieved at the end of the shift. The increased duration may result in filter overloading.
- FCO #18-2: Assessed and reduced Worker air sample flow rate from 2.8L/m to 1.0 L/m to reduce filter overloading.
- FCO #18-3: Day 1 field setting was extremely dry and significant dust was created by vehicles passing through the sampling area on an adjacent access road. Day 2 conditions featured the same soil moisture conditions but overall dust levels were lower since this site did not have an access road.

- FCO # 19-1: Scheduled maintenance work was less than 1,000 feet in length. Therefore, worker ABS sampling period limited compared to Day 1 and Day 2 sampling. Modified sampling plan to suit shortened maintenance length and duration.
- FCO # 22-1: The SAP called for a suspension of work during precipitation events. The SAP was modified to continue sampling during the light to moderate rainfall event that occurred this day.

Since the FCOs represent actual field conditions, these deviations will likely be incorporated into future ABS events and SAP revisions.

5.3 Worker Air Sampling

The breathing space air quality of BNSF personnel involved with railroad maintenance was evaluated with personal air sampling techniques as described below. All personal air samples were collected using the equipment and procedures described in Section 3.3.1. The collection locations of personal air samples are not depicted on Figures 4-10 since the sampled personnel were not stationary.

Two personal air samples were collected each work day to evaluate potential exposure of BNSF maintenance workers to fiber releases. A total of 14 samples were collected during the ABS event. The samples were split between machine operator and laborer positions within the gang. All laborer positions were exposed to the ambient air and sampling of machine operators was biased towards machines that did not have fully enclosed cabs. Since maintenance work could not be interrupted, the sampling period lasted the duration of the working shift.

Blank air samples were collected throughout the ABS event. The blanks are applicable to air samples collected under both the Worker and Public Receptor SAPs.

5.4 Sample Identification Numbers

All samples were assigned a unique sample identification consisting of a prefix followed by a five digit number that signify the order in which the samples were collected. All sample identifications were pre-assigned by CDM. Air samples were designated by a BA prefix (i.e. BA-00001) and the location IDs AD-005568.

6.0 SAMPLING SUMMARY

The following is a discussion of the work areas and daily sampling activities that occurred during the ABS event. The following discussion contains gaps in the personal air sampling numbering since additional samples were collected during the Public Receptor portion of the ABS event. The results of the Public Receptor sampling are discussed under separate cover in the *Activity Based Sampling Summary Report – Public Receptors* (EMR, 2010).

6.1 September 17, 2008

Sampling focused on RP-15 that was relaying approximately 2,000 feet of rail on wood ties at MP 1312, approximately 7.5 miles east of Libby (Figure 3). The following samples were collected (Table 1):

- Two (2) worker personal air samples BA-00001 and BA-00002 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00010.

6.2 September 18, 2008

Sampling focused on RP-15 that was replacing approximately 2,900 feet of rail on wooden ties at Kootenai Falls Siding (MP 1331.5). This work site was approximately 12½ miles west of Libby (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00011 and BA-00012 collected from a BNSF machine operator and laborer, respectively; and
- One (1) air sample blank BA-00020.

6.3 September 19, 2008

Sampling focused on RP-15 that replaced 610 feet of rail on wooden ties at Kootenai Falls Siding (MP 1331). This work site was approximately 12 miles west of Libby (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00021 and BA-00022 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00027.

6.4 September 22, 2008

Sampling focused on RP-15 that replaced 1,400 feet of rail on wooden ties east of Kootenai Falls Siding (MP 1329.5). This work site was approximately 10 miles west of Libby (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00029 and BA-00030 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00036.

6.5 September 23, 2008

Sampling focused on RP-21 that replaced 1,000 feet of rail on concrete ties at the east end of Troy (MP 1337). This work site was approximately 1 mile east of Troy (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00037 and BA-00038 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00046.

6.6 September 24, 2008

Sampling focused on RP-21 that replaced 1,300 feet of rail on concrete ties at the east end of the BNSF Troy yard (MP 1339.5). This work site was approximately 1.5 miles west of Troy (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00047 and BA-00048 collected from a BNSF laborer and machine operator, respectively; and
- Two (2) air sample blanks BA-00056 and BA-00057.

This project completed RP-21's work within OU6.

6.7 September 25, 2008

Sampling focused on RP-15 that replaced 600 feet of rail on wooden ties east of the Troy (MP 1341). This work site was approximately 3.6 miles west of Troy (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00058 and BA-00059 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00069.

This project completed RP-15's work within OU6.



7.0 DISCUSSION OF RESULTS

Worker air sample results are discussed below and summarized in Table 1. Complete laboratory reports and chain of custody forms are found in Appendix D.

7.1 Worker Personnel Air Sampling Results

A total of 14 worker personal air samples were collected during the ABS event. All samples were submitted for analysis via ISO 10312. Analytical sensitivity ranged from 0.00211 structures per cubic centimeter (s/cc) to 0.00769 s/cc. All but three 3 samples (BA-00002, BA-00037, and BA-000038) met the target analytical sensitivity of 0.0024. All samples were non-detect for LA, Other Amphibole (OA) and Chrysotile (Table 1).

7.2 Air Sample Blank Results

A total of 8 blank samples were collected and submitted for analysis. Three of the blanks were not analyzed at the discretion of EMSL and were archived. All of the blanks were non-detect (Table 1).



8.0 REFERENCES

AECOM, 2008a, *Rail Maintenance Worker Receptor Activity-Based Sampling and Analysis Plan - Operable Unit 6*. October, 2008

AECOM, 2008b, *Rail Maintenance Public Receptor Activity-Based Sampling and Analysis Plan - Operable Unit 6*. September, 2008.

EMR, 2008, *Health and Safety Plan – BNSF Maintenance of Way Activity Based Sampling, Libby, Montana*. September, 2008.

EMR, 2010, *Activity Based Sampling Summary Report – Public Receptors*. March, 2010.



9.0 STANDARD OF CARE

The data generated and conclusions provided are based upon the scope of work performed. All work was conducted in a manner consistent with customary principles in the fields of science and engineering. EMR is not responsible for the independent conclusions, opinions, or recommendations made by others based on the data presented in this report. No other warranty, expressed or implied, is made.

The results reported and any opinions reached by EMR are for the benefit of the client and unless agreed to by EMR in writing, are not to be disclosed to or relied upon by any third party. The results and opinions set forth by EMR in this report will be valid as of the date of the report. EMR assumes no obligation to advise you of any changes that may later be brought to our attention.

EMR, Inc., as environmental consultants, respectfully submits this report.

The preceding report was prepared and reviewed by the following EMR personnel.

Author:

A handwritten signature in black ink, appearing to read "Scott Carney".

Scott Carney, PG, CHMM
Senior Geologist

March 12, 2010
Date

Reviewed By:

A handwritten signature in black ink, appearing to read "Dave Welch".

Dave Welch, L.G.
Project Geologist

March 12, 2010
Date



TABLES

Table 1. Summary of ABS Air Sampling Results
Activity Based Sampling Summary Report - Worker Receptor
BNSF RP-15/RP-21
BNSF Kootenai River Subdivision
September 17-25, 2008
EMR Project #5539-120

Index ID	Sample Group	Sample Date	Analysis Date	Sample Type	Volume (L)	Sensitivity	Libby Amphibole s/cc	Other Amphibole s/cc	Chrysotile s/cc	Personnel Name	Job	Milepost
BA-00001	Property	9/17/2008	4/16/2009	Worker	1344	0.00211	<DL	<DL	<DL	Eric Pavlack	Laborer	1312
BA-00002	Property	9/17/2008	4/16/2009	Worker	1333	0.00426	<DL	<DL	<DL	Victor Bachmeier	Cribber Operator	1312
BA-00010	Blank	9/17/2008	10/31/2008	Blank	0	Blank	0	0	0	NA	NA	1312
BA-00011	Property	9/18/2008	4/16/2009	Worker	706	0.00233	<DL	<DL	<DL	Victor Bachmeier	Cribber Operator	1331.5
BA-00012	Property	9/18/2008	4/16/2009	Worker	687	0.00239	<DL	<DL	<DL	Eric Pavlack	Laborer	1331.5
BA-00020	Blank	9/18/2008	10/31/2008	Blank	0	Blank	0	0	0	NA	NA	1331.5
BA-00021	Property	9/19/2008	4/16/2009	Worker	988	0.00231	<DL	<DL	<DL	Eric Pavlack	Laborer	1331
BA-00022	Property	9/19/2008	4/17/2009	Worker	1016	0.00224	<DL	<DL	<DL	Victor Bachmeier	Cribber Operator	1331
BA-00027	Blank	9/19/2008	10/31/2008	Blank	0	Blank	0	0	0	NA	NA	1331
BA-00029	AD-005568	9/22/2008	4/17/2009	Worker	1145	0.00235	<DL	<DL	<DL	Eric Pavlack	Laborer	1329.8
BA-00030	AD-005568	9/22/2008	4/17/2009	Worker	1145	0.00235	<DL	<DL	<DL	Victor Bachmeier	Cribber Operator	1329.8
BA-00036	Blank	9/22/2008	Archived	Blank	0	Blank	0	0	0	NA	NA	1329.8
BA-00037	AD-005568	9/23/2008	4/17/2009	Worker	739	0.00769	<DL	<DL	<DL	Matt Stashick	Laborer	1337
BA-00038	AD-005568	9/23/2008	4/17/2009	Worker	890	0.00319	<DL	<DL	<DL	Dale Johnson	Cribber Operator	1337
BA-00046	AD-005568	9/23/2008	Archived	Blank	-	-	-	-	-	NA	NA	1337
BA-00047	AD-005568	9/24/2008	4/17/2009	Worker	1154	0.00233	<DL	<DL	<DL	Matt Stashick	Laborer	1339.5
BA-00048	AD-005568	9/24/2008	4/17/2009	Worker	1165	0.00231	<DL	<DL	<DL	Karl Harms	Clip Remover Machine	1339.5
BA-00056	AD-005568	9/24/2008	Archived	Blank	0	-	-	-	-	NA	NA	1339.5
BA-00057	AD-005568	9/24/2008	Archived	Blank	0	-	-	-	-	NA	NA	1339.5
BA-00058	AD-005568	9/25/2008	4/17/2009	Worker	510	0.00232	<DL	<DL	<DL	Eric Pavlack	Laborer	1341
BA-00059	AD-005568	9/25/2008	4/17/2009	Worker	501	0.00236	<DL	<DL	<DL	Bryce Vandenberg	Scrap Crane Operator	1341
BA-00069	AD-005568	9/25/2008	11/6/2008	Blank	0	Blank	0	0	0	NA	NA	1341

NA - Not Applicable
DL - Detection Limits



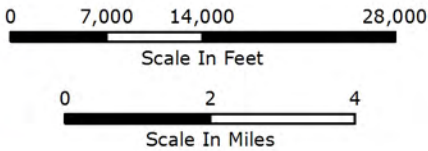
FIGURES



Figure 1
Site Location Map

Activity Based Sampling
Summary Report
--
Worker Receptors

BNSF Kootenai River Sub
Libby, Montana



Project Number: 5539-140
Date: March 8, 2010
Drafted By: KLA
Reviewed By: SJC
Reference: Lincoln Topo MDRNRCS



11 E. Superior St. Suite #260
Duluth, MN 55802
Phone: 218.625.2332
Fax: 218.625.2337



Figure 2
OU6 Overview Map Showing
Commonly Referenced Features

Activity Based Sampling
Summary Report

--
Worker Receptors

BNSF Kootenai River Sub
Libby, Montana

Legend

- Approximate Milepost Locations
- Rail Sidings
- BNSF Railway
- BNSF Yard

0 7,000 14,000 28,000

Scale In Feet

0 2 4

Scale In Miles

Project Number: 5539-140
Date: March 8, 2010
Drafted By: KLA
Reviewed By: SJC
Reference: 2006 Lincoln Aerial



11 E. Superior St. Suite #260
Duluth, MN 55802
Phone: 218.625.2332
Fax: 218.625.2337

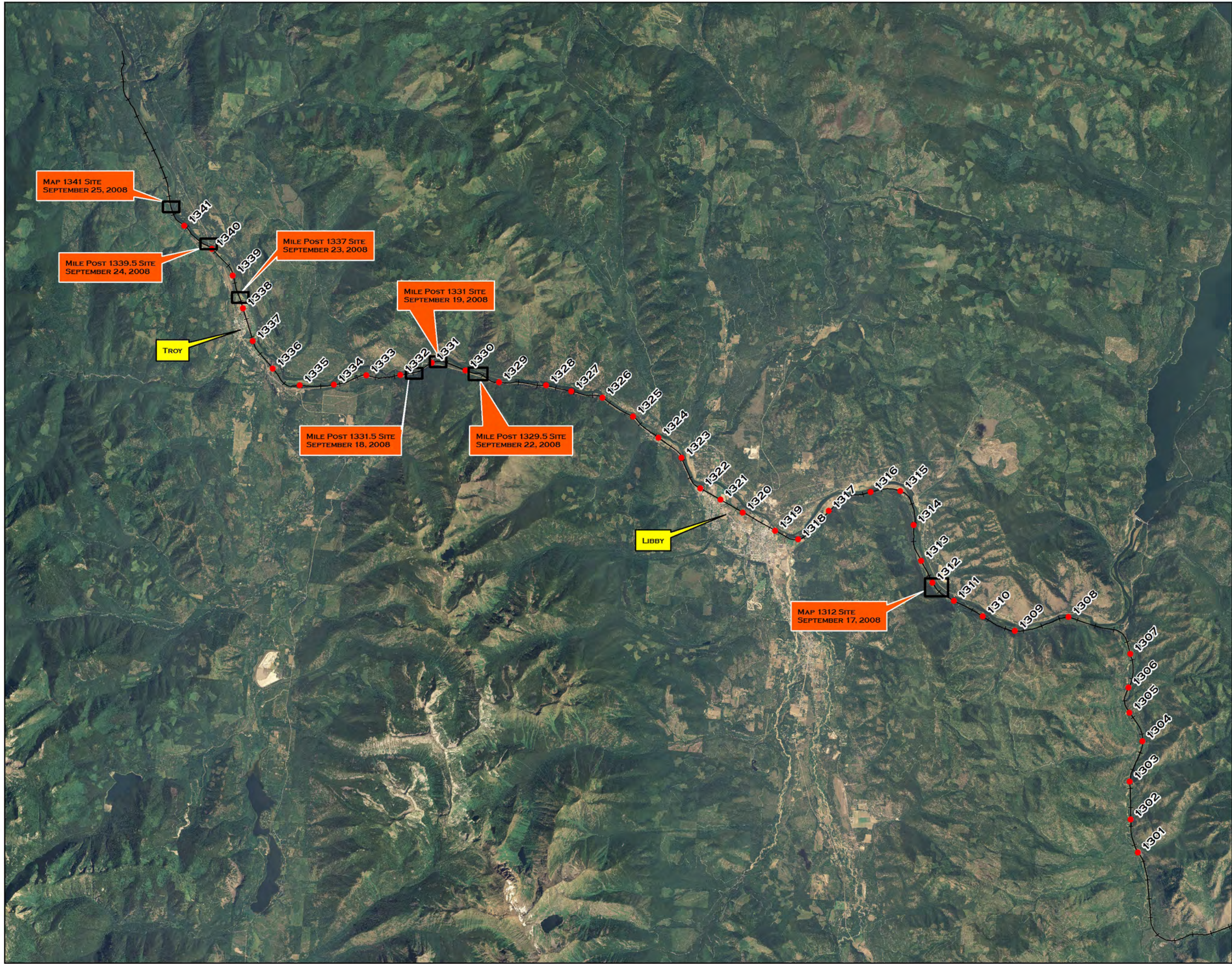


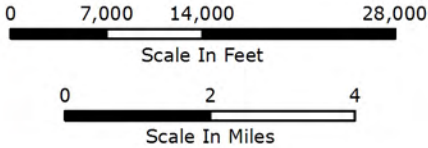
Figure 3
Sampling Index Map

Activity Based Sampling
Summary Report
--
Worker Receptors

BNSF Kootenai River Sub
Libby, Montana

Legend

- Approximate Milepost Locations
- BNSF Railway



Project Number: 5539-140
Date: March 8, 2010
Drafted By: KLA
Reviewed By: SJC
Reference: 2006 Lincoln Aerial



11 E. Superior St. Suite #260
Duluth, MN 55802
Phone: 218.625.2332
Fax: 218.625.2337



APPENDIX A

ANALYTICAL SUMMARIES

SAP ANALYTICAL SUMMARY # OU6RR1008
SUMMARY OF PREPARATION AND ANALYTICAL REQUIREMENTS FOR ASBESTOS

SAP Title: Rail Maintenance Worker Activity-Based Sampling and Analysis Plan

SAP Date (Revision): TBD

EPA Technical Advisor: Rebecca Thomas

(contact to advise on DQOs of SAP related to preparation/analytical requirements)

Sampling Program Overview: This document is the Rail Maintenance Worker Activity-Based Sampling and Analysis Plan (SAP) for the collection and analysis of samples of outdoor air in the immediate vicinity of rail maintenance activities that may actively disturb outdoor soil on portions of BNSF Railway Company (BNSF) Right-of-Way (ROW), which is located within Operable Unit (OU) six of the Libby, Montana, Superfund Site. This SAP addresses worker receptors that may be exposed to asbestos in air as a result of BNSF rail maintenance activities. Potential exposures will be evaluated through the collection of personal air samples (to provide valuable information for scoping the RI/FS Work Plan for OU6). A total of 14 personal air samples will be collected.

Index ID Prefix: BA = Air

Medium-Specific TEM/PCM Preparation and Analytical Requirements for Field Samples:

Medium Code	Medium, Sample Type	Preparation Details				Analysis Details			Applicable Laboratory Modifications (c)
		Investigative? (a)	Indirect Prep? (a,b)		Filter Archive? (b)	Method(s)	Recording Rules	Analytical Sensitivity/ Stopping Rules	
			With Ashing (b)	Without Ashing (b)					
A	Outdoor ABS Worker Air Samples	Yes	Yes Based on Analyst's Judgement	No	Yes	TEM ISO 10312	All Asbestos structures counted; L: $\geq 0.5\mu\text{m}$ AR: $\geq 3:1$	Count until 1 is achieved: i) Target S = 0.0001 cc-1(d), ii) 50 LA found, or iii) 0.5 mm ² of filter is evaluated	LB-000016, LB-000016a, LB-000019, LB-000028, LB-000029, LB-000029a, LB-000029b, LB-000030, LB-0000031, LB-000031a, LB-000045, LB-000053, LB-000066, LB-000084, LB-000085

(a) See LB-000053 for additional details

(b) See most current version of EPA-LIBBY-08 for preparation details

(c) Use most recent versions of listed modifications

(d) Target sensitivity is set at 0.0001 cc-1; however, according to the Field Change Order (FCO) #17-1 (attached), sensitivity was adjusted to 0.0024 cc-1.

TEM/PCM Preparation and Analytical Requirements for Quality Control Samples:

Medium Code	Medium, Sample Type	Preparation Details			Analysis Details			Applicable Laboratory Modifications (c)
		Indirect Prep?		Filter Archive? (b)	Method(s)	Recording Rules	Stopping Rules	
		With Ashing (b)	Without Ashing (b)					
B	Field Blank	No	No	Yes	TEM ISO 10312	All Asbestos structures counted; L: $\geq 0.5\mu\text{m}$ AR: $\geq 3:1$	Count until 0.1 mm ² of filter is evaluated	LB-000016, LB-000016a, LB-000019, LB-000028, LB-000029, LB-000029a, LB-000029b, LB-000030, LB-0000031, LB-000031a, LB-000045, LB-000053, LB-000066, LB-000084, LB-000085
C	Lot Blank	No	No	Yes	TEM ISO 10312	All Asbestos structures counted; L: $\geq 0.5\mu\text{m}$ AR: $\geq 3:1$	Count until 0.1 mm ² of filter is evaluated	LB-000016, LB-000016a, LB-000019, LB-000028, LB-000029, LB-000029a, LB-000029b, LB-000030, LB-0000031, LB-000031a, LB-000045, LB-000053, LB-000066, LB-000084, LB-000085

(d) Target sensitivity is set at 0.0001 cc-1; however, according to the Field Change Order (FCO) #17-1 (attached), sensitivity was adjusted to 0.0024 cc-1.

PLM Preparation and Analytical Requirements:

Medium Code	Medium, Sample Type	Preparation Method	Analysis Method	Applicable Laboratory Modifications

Laboratory Quality Control Frequencies:

TEM: Lab Blank – 4%
 Recount Same – 1%
 Recount Different – 2.5%
 Verified Analysis – 1%
 Repreparation – 1%
 Interlab – 0.5%

PLM: Lab Duplicate – ____%
 Interlab – ____%

Requirements Revision:

Revision #:	Effective Date:	Revision Description

Analytical Laboratory Review Sign-off:

☐ Batta [sign & date: _____]
☐ EMSL-Libby [sign & date: _____]
☐ EMSL – Westmont [sign & date: _____]
☐ EMSL – Beltsville [sign & date: _____]

☐ ESAT [sign & date: _____]
☐ Hygeia [sign & date: _____]
☐ MAS [sign & date: _____]
☐ RESI [sign & date: _____]

[Checking the box and initialing above indicates that the laboratory has reviewed and acknowledged the preparation and analytical requirements associated with the specified SAP.]



APPENDIX B

FIELD NOTES

LIBBY, MT & TROY, MT
BNSF RAIL MAINTENANCE
ACTIVITY BASED SAMPLING (ABS)
FIELD BOOK #1

START DATE

09-17-08



"Rite in the Rain"

ALL-WEATHER
ENVIRONMENTAL

No. 550

6 Location MP 1312 Hi side LEFT Date 9-17-08
Project / Client BNSF

0545 EMR ARRIVED ON SITE FOR SAFETY MEETING.

0550 BNSF REP MET WITH SCOTT CARNEY & DAVID WELCH TO DISCUSS HOW TO HANG PUMPS ON WORKERS. ALSO MET WITH LAURA FROM ENSR AND NICOLE WITH CDM AT THIS TIME.

0608 BNSF SAFETY MEETING. TRACK TRAVELING FROM HARBOR TO RIPLEY, WAS EXPLAINED. GOOP SUITS & BOOTIES ARE PPE FOR BNSF EMPLOYEES.

EMPLOYEES WITH PERSONAL PUMPS:

0630 ABS * VICTOR BACHMEIER 2767 BA-00002 004868
0630 ABS * ERIC PAULACK 0145 BA-00001 004867
* VICTOR IS CRIB OPERATOR STOP TIME 1436
* ERIC IS LABORER 1432

BOTH PUMPS START TIME 0636

0621 SAFETY MEETING ENDS. BNSF EMPLOYEES OUTFIT INTO LEVEL D PPE WITH SUITS.

7 Location MP 1312 Hi side LEFT Date 9-17-08
Project / Client BNSF

OSHA SAMPLES

A JOSH SYNNOTT 8473 GROUND CREW
~~OSHA SAMPLES~~ 09-17-08
B BRYCE VANDENBERG 6225 SCRUB CANE OP.
C RODNEY ZIMMERMANN 3662 TAMPER OP.
D KAGEN COX 9430 LABORER
E RYAN TUCKER 3932 LABORER
F MIKE COSSART 8354 SPIKER

PUMP NUMBERS

		PUMP START
C	RODNEY ZIMMERMAN #3	0637
D	KAGEN COX #4	0639
A	JOSH SYNNOTT #5	0641
E	RYAN TUCKER #6	0642
B	BRYCE VANDENBERG #7	0644
F	MIKE COSSART #8	0645

- BNSF REP BRETT PETERSON FOREMAN
0654 LEFT SAFETY MEETING AREA FOR RIPLEY.

0704 ARRIVED AT RIPLEY

TEAM MEMBERS: TASKS

SCOTT CARNEY (EMR) AIR / WEATHER MONITOR
DAVE WELCH (EMR) SOIL / AIR SAMPLING
JOHN STARR (EMR) AIR MONITORING

Location B MP 1312 Date 09-17-08
 Project / Client BNSF

TEAM MEMBERS CONT

AMANDA THORNTON (EMR) ^{WEATHER STATION / FIELD BOOK} SOIL SAMP.
 MATT LENZ (EMR) AIR SAMP. / GPS / VIDEO
 LAURA TROZZOLO
 NICOLE (CDM)
 BEIN

0710 EMR SAFETY MEETING

- TRACK PROTECTION MAIN IS NOON
SIDING IS 1130
- HOSPITAL IS IN LIBBY ON
3RD & LOUISIANA.

0720 SAFETY MEETING ENDS BEGIN
EQUIPMENT SET UP.

0737 BNSF ARRIVES ON SITE

0743 BRETT PETERSON GAVE US INFO AS FOLLOWS:
 MAIN 3046-6 WBCS WSS
 RIVERVIEW TO WESS RIPLEY
 SIDING 246-7 ESS RIPLEY TO
 WSS RIPLEY

BOTH TRACKS ^{UNTIL} PACIFIC 1130

0811 DAVE WELCH STARTED SETTING UP
 SOIL SAMPLING PLOTS
 GENERATORS UP & RUNNING
 WEATHER STATION UP & RUNNING

Location MP 1312 Date 09-17-08
 Project / Client BNSF

CURRENT WEATHER CONDITIONS:

TEMP 38°F, CLEAR SKIES WITH
 VERY MINIMAL CLOUDS

0847 DAVE WELCH & AMANDA
 THORNTON DON TYVEK SUITS, BOOTIES,
 & PERSONAL PUMPS TO BEGIN
 TRESSPASSING ACTIVITIES

^{START} 0749 AMANDA 4441 BA-00003 SHEET 004869
 0749 DAVE 9586 BA-0004 SHEET 004870

0930 SCOTT CARNEY LEFT TO REPLACE
 ONE OF THE GENERATORS. IT STOPPED
 WORKING.

1001 BNSF GANG PASS MP 1312
 HEADING WEST

1021 SCOTT CARNEY ARRIVED BACK
 FROM GETTING A NEW WORKING
 GENERATOR.

1037 SAMPLING OF SOIL BEGINS

SAMPLE 1

RR- 00001

SP- 138460

> SHEET #
 005922

Location BT MP 1312Date 09-17-08Project / Client BNSF

DAVE WELCH COLLECTS 3 FINGERS
HIGH FULL OF SOIL IN A ONE GALLON
ZIPLOC[®] BAG FOR SAMPLING ANALYSIS.
1044 MATT LENZ TAKES GPS
LOCATION OF SAMPLE POINT (SP) 1

1048 **RR- 00002** SOIL SAMPLE
#2 IS TAKEN
SP- 138461 SHEET #005922

1048 MATT LENZ TAKES GPS LOCATION
OF SP 2

1049 LOW AMOUNT OF VERMICULITE (VISUAL)
FOUND IN SOIL

1057 **RR- 00003** SOIL SAMPLE #3
IS TAKEN
SP- 138462 SHEET #005922

1057 LOW AMOUNT OF ~~TA~~ VISUAL VERMICULITE
MOSTLY DISSEMINATED

1057 MATT LENZ TAKES GPS LOCATION
OF SP #3

Location MP 1312Date 09-17-08Project / Client BNSF

1105 **RR- 00004** SOIL SAMPLE
#4 IS TAKEN
SP- 138463 SHEET #005923

1105 LOW AMOUNT OF ~~VET~~ VISUAL VERMICULITE
FOUND IN SOIL (MOSTLY DISSEMINATED)

1105 MATT LENZ TAKES GPS LOCATION
OF SP #4

1113 **RR- 00005** SOIL SAMPLE #5
IS TAKEN
SP- 138464 SHEET #005923

1113 LOW AMOUNT OF VERMICULITE (VISUAL)
FOUND IN SOIL (MOSTLY DISSEMINATED)
PLOT OF COAL IN THE VICINITY

1113 MATT LENZ TAKES GPS LOCATION
OF SP #5

1122 **RR- 00006** SOIL SAMPLE #6
IS TAKEN
SP- 138465 SHEET #005923

1122 NO VERMICULITE FOUND IN SOIL
VISUAL

1122 MATT LENZ TAKES GPS LOCATION OF SP #6

Location MR 1312Date 09-17-08Project / Client BNSF

1129 **RR- 00007** SOIL SAMPLE #7
IS TAKEN
SHEET #005924

SP- 138466

1129 NO VISUAL VERMICULITE PRESENT
1129 MATT LENZ TAKES GPS LOCATION
OF SP#7

1138 **RR- 00008** SOIL SAMPLE #8
IS TAKEN
SHEET # 005924

SP- 138467

1138 NO VISUAL VERMICULITE FOUND
1138 MATT LENZ TAKES GPS LOCATION
OF SP#8

1147 **RR- 00009** SOIL SAMPLE #9
IS TAKEN
SHEET # 005924

SP- 138468

1147 LOW AMOUNT OF VISUAL VERMICULITE
ENCOUNTERED
1147 MATT LENZ TAKES GPS LOCATION OF
SP#9

Location MP 1312Date 09-17-08Project / Client BNSF

1156 **RR- 00010** SOIL SAMPLE
#10 IS TAKEN
SHEET #005925

SP- 138469

1156 LOW AMOUNT OF VISUAL VERMICULITE
ENCOUNTERED
1156 MATT LENZ TAKES GPS LOCATION
OF SP #10

1204 **RR- 00011** SOIL SAMPLE
11 IS TAKEN
SHEET #005925

SP- 138470

1204 LOW AMOUNT OF VISUAL
VERMICULITE ENCOUNTERED
1204 MATT LENZ TAKES GPS LOCATION
OF SP# 11

1214 **RR- 00012** SOIL SAMPLE #12
IS TAKEN
SHEET #005925

SP- 138471

1214 LOW AMOUNT OF VISUAL VERMICULITE
ENCOUNTERED
1214 MATT LENZ TAKES A GPS LOCATION
OF SP #12

14

Location MP 1312Date 09-17-08Project / Client BNSF

*OUT OF SEQUENCE

1233

RR- 00013

SOIL SAMPLE #13

IS TAKEN

SHEET # 005926

SP- 138472

1233

NO VISUAL VERMICULITE ENCOUNTERED

1233

MATT LENZ TOOK GPS LOCATIONS
OF SP#s 13, 14, & 15.

1254

RR- 00014

SOIL SAMPLE #14

IS TAKEN

SHEET # 005926

SP- 138473

*1245

TRAIN #
7407BNSF TRAIN PASSES BY. ALL
PERSONNEL CLEAR OF TRACKS ^{EAST} BOUND

1256

TRAIN #
5482ANOTHER EAST BOUND
TRAIN PASSES BY. ALL PERSONNEL
CLEAR OF TRACKS.

1306

COMMENCED SOIL SAMPLING.

1306

LOW AMOUNT OF VISUAL
VERMICULITE ENCOUNTERED

1316

RR- 00015

SOIL SAMPLE #15

IS TAKEN

SHEET # 005926

SP- 138474Location MP 1312Date 09-17-08

15

Project / Client BNSF

1316 NO VISUAL VERMICULITE PRESENT

1317 SOIL SAMPLING FOR TODAY

IS COMPLETE

1331 FLOW RATE OF PERSONAL PUMPS

AMANDA THORNTON 2.4 L/min

DAVE WELCH 2.8 L/min

NO FURTHER ENTRIES

AMANDA THORNTON 09-17-08

10 Location KOOTENAI SUBDIVISION Date 09-18-08
Project / Client BNSE

0600 ARRIVED ONSITE FOR BNSE SAFETY MEETING

0602 COUGAR CROSSED TRACKS IN FRONT OF US!

0610 BNSE GANG GATHERED FOR SAFETY MEETING

0611 - ONLY MAIN LINE TODAY 0730-1500 PK. TIME
- 2900'
- Tying UP AT KOOTENAI FALLS TODAY
- PPE FOR BNSE GANG IS GLOVES SUITS AND BOOTS

0630 BNSE GANG STRETCHES BEFORE WORK

PUMP STATION	SN#	SAMPLE #
0642 RYAN TUCKER	3932	LABORER 11
0644 JOSH SYNNOTT	8473	LABORER 12
0646 BRYCE VANDENBERG	6224	MACHINE 13
0648 MIKE COSSART	8354	OPERATOR 14
0650 KAGEN COX	9436	LABORER 15
0652 RODNEY ZIMMERMAN	3462	TAMPER 16

0655 BMR LEFT FOR KOOTENAI FALLS

0720 EMR ARRIVED ONSITE AT KOOTENAI FALLS (MP 1330.61331.9)

0924 EMR WAITED FOR BNSE CREW TO ARRIVE AT MP 1331.5. SAFETY TAILGATE MEETING HELD NOW.

17 Location MP 1331.5 Date 09-18-08
Project / Client BNSE

0932 - N. SIDE SIDING TRACK PROTECTION. TRAINS WILL BE COMING THROUGH. EVERY MACHINE WILL KNOW WHEN TRAINS ARE COMING

- SOIL ONLY ON NORTH SIDE FOR SAMPLING.

- NOTIFY BNSE PERSONNEL IN CASE OF EMERGENCY. HWY 2 INTO LIBBY FOR NON-CRITICAL EMERGENCY.

- DOUBLE READ (QC) PAPERWORK & INITIAL BEFORE HANDING IN TO CDM

- SOIL SAMPLE AD#'s AD 005568 ON EVERY SHEET.

0941 - SAFETY MEETING ENDED.

0948 - EMR ARRIVES AT JOB ACTIVITY SITE

1004 - AMANDA THORNTON & DAVE WELCH DON TYVEK SUITS & PERSONAL PUMPS

1006 - DAVE WELCH & AMANDA THORNTON TURN PERSONAL PUMP ON TO BEGIN TRESPASSING ACTIVITIES.

Location MP 1331.5 Date 09-18-08Project / Client BNSF

*OUT OF SEQUENCE

1010	MATT LENZ DONS AND ACTIVATES PERSONAL PUMP. ALL PUMPS SET TO 2.8 L/MIN.
1024	WEATHER STATION UP & RUNNING CURRENT WEATHER 54.9°F CLEAR BLUE SKIES WIND SPEED VARIES 0.6-2.4 MPH. SUNNY.
1026	MAKE SURE & CHECK WEATHER STATION EVERY HOUR
*1004	DAVE WELCH MARKS SOIL SAMPLE LOCATIONS
1107	RR- 00016 SOIL SAMPLE #16 IS TAKEN SHEET #005927
	SP- 138475
1107	NO VISUAL VERMICULITE SEEN.
1110	LABELS KEEP FALLING OFF OF SAMPLE BAGS.
1115	RR- 00017 SOIL SAMPLE #17 IS TAKEN SHEET #005927
	SP- 138476
1115	NO VISUAL VERMICULITE (VV) SEEN

Location MP 1331.5 Date 09-18-08 19Project / Client BNSF

1118	RR- 00018 SOIL SAMPLE #18 IS TAKEN SHEET #005927
	SP- 138477
1120	ACTUAL TRESSPASERS ON SITE OLD MAN & LADY FISHING W/ NOT 09-18-08 2 SCHNOWSERS.
1120	NO VV SEEN.
1142	RR- 00019 SOIL SAMPLE #19 IS TAKEN SHEET #006101
	SP- 138478
1142	NO VV ENCOUNTERED
	NOTE: 18 MIN TIME SPAN BETWEEN SAMPLES 18 & 19 WERE DUE TO HAVING TO RETRIEVE FIELD SUPPLIES FROM TRUCK & SPEAKING WITH TRESSPASERS.
1152	RR- 00020 SOIL SAMPLE #20 IS TAKEN SHEET #006101
	SP- 138479
1152	LOW AMOUNT OF VV SEEN. DISSEMINATED VV.

Location MP 1331.5 Date 09-18-08Project / Client BNSF

1200

RR- 00021

SOIL SAMPLE #21

IS TAKEN

SHEET # 006101

SP- 138480

1200

LOW AMOUNT OF DISSEMINATED
VV ENCOUNTERED.

1213

RR- 00022

SOIL
SAMPLE # 22 IS

TAKEN

SHEET # 006102

SP- 138481

1213

LOW AMOUNT OF VV ENCOUNTERED

1227

RR- 00023

SOIL SAMPLE #23 IS
TAKEN

SHEET # 006102

SP- 138482

1227

LOW AMOUNT OF DISSEMINATED
VV ENCOUNTERED

NOTE

SAMPLE #24 WILL NOT BE USED
AND WAS NOT COLLECTED. WE
WILL RESUME AT #25. THIS WAS
MY MISTAKE BY PRELABELING
THE FORMS.

1312

GPS POINT TAKEN OF SAMPLE #23.

Location MP 1331.5Date 09-18-08 21Project / Client BNSF1313 GPS LOCATION TAKEN OF SOIL
SAMPLE #221314 GPS LOCATION TAKEN OF SOIL
SAMPLE #211315 GPS LOCATION TAKEN OF SOIL
SAMPLE #201316 GPS LOCATION TAKEN OF SOIL
SAMPLE #191316 GPS LOCATION TAKEN OF SOIL
SAMPLE #181317 GPS LOCATION TAKEN OF SOIL
SAMPLE #71318 GPS LOCATION TAKEN OF SOIL
SAMPLE #13

NOTE ALL GPS LOCATION WERE
TAKEN BY MATT LENZ OF EMR
1350 BNSF TRAIN PASSED BY NORTH
BOUND

1417 2 TRESPASSERS CROSS TRACKS
TO GO FISHING FOR SALMON
1600 EMR LEFT
PREMISES

NO FURTHER ENTRIES
#07 AMANDA THORNTON

Location MP 1330.5 1331 Date 09-19-08
 Project / Client BNSF

Location MP 1330.5 1331 Date 09-19-08 23
 Project / Client BNSF

0555 ALLEMP TEAM ARRIVE ON SITE
 FOR BNSF SAFETY MEETING

0603 ROW 6.28.3
 SAFETY MEETING 212 Injury FREE DAY
 JOB KOOTENAI SIDING
 GO 16
 GO 20
 SI 16
 610 FEET LEFT TO COMPLETE
 MAIN & SIDING TRACK PROTECTION
 ALTERNATION BETWEEN THE TWO
 TYING UP HERE FOR MONDAY
 CONCRETE WORK NEXT WEEK
 TYING WOOD UP AT TROY BY
 WED. OR THURS. NEXT WEEK
 GOOP SUITS & BOOTIES FOR BNSF
 EMPLOYEES PPE.
 - 406672 9146 CHAD
 GOHMAN TUES WOOD JOB

START TIME	SSN #	SAMPLE #
0631	RODNEY ZIMMERMAN 3662	TAMPER #19
0641	KAGEN COX 9480	LABORER #24
0633	JOSH SYNNOT 8473	MACHINE OPERATOR #20
0639	BRYCE VANDENBERG 6225	" #23
0637	MIKE COSSAIRT 8354	" #22

START TIME	SSN #	SAMPLE #
0635	RYAN TUCKER 3932	LABORER #21
0648	DAVE WELCH #4091	TURN PUMPS ON
	AMANDA THORNTON 4095	
	MATT LENZ 4099	
0707	CURRENT WEATHER CONDITIONS 50.2°F WIND SPEED 0.6 MPH CLEAR DAY WITH NO CLOUDS NO RAIN FORECASTED.	
0707	WEATHER STATION UP & RUNNING	

SAMPLE #'S FOR EMPLOYEES

AMANDA THORNTON	# BA-00024
MATT LENZ	# BA-00025
DAVID WELCH	# BA-00023

0754	RR- 00025	SOIL SAMPLE #25 IS TAKEN
	SP- 138484	SHEET #006103
0754	NO VV SEEN	
0804	RR- 00026	SOIL SAMPLE #26 IS TAKEN
	SP- 138485	SHEET #006103

Location MP 1330.5 1331 Date 09-19-08Project / Client BNSF

0804	NO VV SEEN IN SAMPLE #26
0813	RR- 00027 SOIL SAMPLE #27 IS TAKEN SHEET #006103
	SP- 138486
0813	NO VV ENCOUNTERED
0821	RR- 00028 SOIL SAMPLE #28 IS TAKEN SHEET #006104
	SP- 138487
0821	NO VV ENCOUNTERED
0832	RR- 00029 SOIL SAMPLE #29 IS TAKEN SHEET #006104
	SP- 138488
0832	NO VV ENCOUNTERED
0842	RR- 00030 SOIL SAMPLE #30 IS TAKEN SHEET #006104
	SP- 138489
0842	NO VV ENCOUNTERED
NOTE	ROADMASTER TODAY IS ROCKY LASORTE.
0935	SOIL SAMPLE 00025 GPS LOCATION TAKEN

Location MP 1330.5 1331 Date 09-19-08Project / Client BNSF

0936	GPS TAKEN OF SAMPLE #26
0937	GPS TAKEN OF SAMPLE #27
0938	GPS TAKEN OF SAMPLE #28
0940	GPS TAKEN OF SAMPLE #29
0941	GPS TAKEN OF SAMPLE #30
1218	EMR BREASS DOWN EQUIPMENT
1240	EMR LEAVES WORK SITE (ESTIMATED TIME)

NO FURTHER EXPLORATION
AMANDA THORNTON
9.19.08

Location 1331 MP TIE-UP

Date 9-22-08

Project / Client BNSF

0535 DAVE WELCH & AMANDA THORNTON ARRIVE ON SITE (EMPLOYEES).

- WEATHER 50°F & RAINING. ALSO RAINED LAST NIGHT.

9:00 AM
0600 ESS KOOTENAI FALLS & WSS KOOTENAI FALLS.

610' FRIDAY

1120' & 1400' TODAY

1120' WOOD CV ^{ACT 9-22-08} 13271400' CV ^{ACT 9-22-08} 1329A 1329A

1200 TIME TRAIL PROTECTION

0600 BNSF SAFETY MEETING

MAIN LINE IS LIVE AMTRAK WBST - BOUND.

[NOTE] ALL PUMPS SET TO 28 L/MIN.

START TIME	NAME	SSN	JOB	SAMPLE #
0621	RYAN TUCKER	3932	LABORER	27
0624	MARLECKSTROM	4489	LABORER	28
0626	COLBEY CHRISTIE	7073	LABORER	29
0629	JOSH SYNNOT	8473	LABORER	30
0633	BRYCE VANDENBERG	1325	MACHINE OPER.	31
0636	MIKE COSSAIRT	8354	MACHINE OPER.	32

0715 EMR & BNSF LEAVE FOR WORK AREA
BNSF WILL MEET EMR AT MP 1329.8

Location MP 1329.8

Date 09-22-08 27

Project / Client BNSF

0939 WEATHER STATION UP & RUNNING
TEMP 54°FWIND SPEED VARIABLE BETWEEN
7.8 MPH & 6.0 MPH

0941 BA-00031 MATT LENZ

0946 BA-00032 AMANDA THORNTON

0947 DAVE WELCH & JOHN STARR
ARE IN THE PROCESS OF SETTING
UP PERIMETER1009 DAVE WELCH LEFT TO MAKE A
PHONE TO CLARIFY BNSF
DIRECTIONS.1021 DAVE WELCH RETURNS TO MP 1329
[NOTE] ROADMASTER WAS NOT CLEAR
ON HIS WHITEBOARD OR VERBALLY
WHERE THEIR WORK ZONE WOULD
BE TODAY.1025 EMR BROKE DOWN EQUIPMENT &
WENT TO MP 1329.8

1040 EMR ARRIVED AT MP 1329.8

1043 WEATHER STATION UP & RUNNING

1046 PERIMETER PUMPS BEING SETUP

1100 SOIL SAMPLE PLOTS SET UP

THIS 107
9-22-08

Location MP 1329.8Date 9-22-08Project / Client BNSF

1115	RR- 00031	SOIL SAMPLE #31 IS TAKEN SHEET # 006105
1115	SP- 138490	
1115	NO VV SEEN	
1122	RR- 00032	SOIL SAMPLE #32 IS TAKEN SHEET # 006105
	SP- 138491	
1122	NO VV SEEN	
1123	BEGIN TO RAIN AGAIN	
1128	RR- 00033	SOIL SAMPLE #33 IS TAKEN SHEET # 006105
	SP- 138492	
1128	NO VV SEEN	
<u>NOTE</u>	ALL SOIL SAMPLED TODAY IS COARSE SILTY-SAND WITH TOPSOIL & BALLAST INTERMIXED	
1133	RR- 00034	SOIL SAMPLE #34 IS TAKEN SHEET # 006106
	SP- 138493	
1133	NO VV SEEN	

Location MP 1329.8Date 9-22-08Project / Client BNSF

1133	SOIL IS VERY WET	
1143	RR- 00035	SOIL SAMPLE #35 IS TAKEN SHEET # 006106
	SP- 138494	
1143	NO VV SEEN	
1155	RR- 00036	SOIL SAMPLE #36 IS TAKEN SHEET # 006106
	SP- 138495	
1150	LOW AMOUNT OF DISSEMINATED VV SEEN	
1200	RR- 00037	SOIL SAMPLE #37 IS TAKEN SHEET # 006107
	SP- 138496	
1200	NO VV SEEN	
<u>NOTE</u>	LACK OF VV COULD BE DUE TO SOIL MOISTURE CONTENT BEING VERY HIGH.	
1208	RR- 00038	SOIL SAMPLE #38 IS TAKEN SHEET # 006107
	SP- 138497	

Location MP 1329.8

Date 9-22-08

Project / Client BNSF

* OUT OF SEQUENCE

1209 THE SOIL SAMPLE #38 IS THE ONLY DRY SAMPLE TAKEN BUT WITH THE SAME COMPONENTS MENTIONED EARLIER

1209 NO VU SEEN

1210 SOIL SAMPLE ACTIVITY CONCLUDES

1227 GPS IS TAKEN OF SOIL SAMPLE PLOT #31

1229 GPS IS TAKEN OF SOIL SAMPLE PLOT #32

1230 GPS IS TAKEN OF SOIL SAMPLE PLOT #33

1231 GPS IS TAKEN OF SOIL SAMPLE PLOT #34

1232 GPS IS TAKEN OF SOIL SAMPLE PLOT #35

1234 GPS IS TAKEN OF SOIL SAMPLE PLOT #36

1235 GPS IS TAKEN OF SOIL SAMPLE PLOT #37

1236 GPS IS TAKEN OF SOIL SAMPLE PLOT #38

NOTE ALL GPS LOCATIONS WERE TAKEN BY MATT LENZ OF EMR

1237 GPS IS TAKEN OF WEATHER STATION
GPS IS TAKEN OF STATIONARY PUMP #1401
#BA-00034

1239 GPS IS TAKEN OF STATIONARY PUMP #836A
BA-00035

*1030 GENERATORS FOR STATIONARY PUMPS SWITCHED OUT.

NO FURTHER ENTRIES
AMANDA THORNTON

Location MP 1337. B TROY RAIL YARD Date 9-23-08

Project / Client BNSF

0540 DAEWELCH & AMANDA THORNTON
PROMEMO ARRIVE ON SITE

~~0540~~ 0545 DAEWELCH & JOHN STARR
TALK WITH ROADMASTER CHAD
~~BEAUMONT~~ DOUGHMAN

0600 BNSF SAFETY MEETING COMMENCES
REGAGE CURVE MP 1337. B
1100 FT HIGH SIDE RIGHT HAND RAIL

START TIME	NAME	SSN	JOB	SAMPLE #
0628	KARL HARMS	1954	ANCHOR BOX OPER.	40
0631	JODY CROWE	5426	PLATE BLOCKER OPER	35
0632	BEN ROBERTSON	5372	LABORER	36
0635	CLINT EGERTS	3009	MACHINING OPER	37
0636	CJ CAVEN	1405	SPICA PULLER	38
0638	JUSTIN GARRETT	1267	DRY LAGER	39
0640	MATT STASHICK	7132	LABORER	40
	STEWART STEWART	9955	LABORER	41
0631	DALE JOHNSON	5315	CRIBBER OPER	
0640	ALL PUMPS HUNG & STARTED.			
0710	TRESPASSER PUMP (AMANDA THORNTON) STARTED			
0720	WEATHER STATION UP & RUNNING TEMP 45.4°F - FOGGY WIND SPEED 0.6 MPH			

Location MP 1337 B TROY RAIL YARD Date 09-23-08Project / Client BNSF

0730 PERIMETER PUMPS STARTED

0819 TEMP 38°F

0831 SOIL SAMPLE #39

RR- 00039

IS TAKEN

SHEET # 006108

SP- 138498

0831 LOW VV SEEN

TEXTURE: SANDY SOIL WITH LOTS OF
WOOD & OIL & COARSE GRAVEL

0838 SOIL SAMPLE #40

RR- 00040

IS TAKEN

SHEET # 006108

SP- 138499

TEXTURE: SAME AS ABOVE

HARD TO SEE ANY VV WITH THIS SOIL

BEING SO SATURATED

0838 NO VV SEEN

0848 SOIL SAMPLE #41

RR- 00041

IS TAKEN

SHEET # 006108

SP- 138500

TEXTURE: SAME AS ABOVE

0848 LOW VV SEEN

Location MP 1337 B TROY RAIL YARD Date 09-23-08Project / Client BNSF* OUT OF SEQUENCE DUE TO MACHINE THROWING
ROCKS

0856 RR- 00042

SOIL SAMPLE #42

IS TAKEN

SP- 138501

SHEET # 006109

0856 LOW AMOUNT OF VV SEEN

TEXTURE: SAME AS BEFORE

* 0924

RR- 00043

SOIL SAMPLE #43

IS TAKEN

SHEET # 006109

SP- 138502

[NOTE] RAIL WORKERS ARE NOT WEARING
RESPIRATORS NOR WERE THEY TOLD
TO DO SO

0913

RR- 00044

SOIL SAMPLE #44

IS TAKEN

SHEET # 006109

SP- 138503

0913 LOW VV SEEN

TEXTURE: SAME AS BEFORE

0924

RR- 00043

SP- 138502

LOW VV SEEN

Project / Client BNSF

0936

RR- 00045

SOIL SAMPLE #45

IS TAKEN

SHEET # 006110

SP- 138504

TEXTURE IS SAME AS BEFORE

0936

LOW AMOUNT OF VUSION

0947

RR- 00046

SOIL SAMPLE # 46

IS TAKEN

SHUT #006110

SP- 138505

0947

~~LOW AMOUNT OF WASTE~~

MEDIUM AMOUNT OF VV SEEN

1008

GPS OF SOIL SAMPLE #39 TAKEN

WIO

GPS OF SOIL SAMPLE # 40 TAKEN

1012

GPS OF SOIL SAMPLE #41 TAKEN

-1015

GPS OF SOIL SAMPLE #42 TAIKOU

1017

GPS OF SOIL SAMPLE #43 TAKEN

1019

GPS OF SOIL SAMPLE #44 TAKEN

1021

GPS COORDINATE SAMPLE #45 TAKEN

1025

GPS OF SOIL SAMPLE # 46 TAKEN

NOTE

NOW THAT THE SUN IS OUT & FOG HAS
CLEARED WE SEE VV EVERYWHERE!

1022

GENERATOR FOR STATIONARY PUMPS
ON SOUTH TRACKS WENT DEAD.

SAMPLES NOT SUBMITTED

Project / Client BNSF

NOTE OF MAJOR CONCERN ROADMASTER OF RP-21 WAS TOLD BY DAVE WELCH OF EMR THAT IT WOULD BE ADVISEABLE TO HAVE HIS WORKERS WEAR RESPIRATORS, BASED ON THE SITE HISTORY OF THE TROY RAIL YARD. HIS WORKERS WERE NOT EVEN INFORMED THAT THERE WAS A THREAT. THE WORKERS AT LEAST DESEARVE THE INFORMATION TO MAKE A PERSONAL CHOICE ON WHETHER OR NOT TO DON A RESPIRATOR.

400 ENR LEFT FOR CDM

NO FURTHER ENTRIES
STANDARD THERMISTOR
BY 23-88

Location TROY YARD TIEUP Date 09-24-08Project / Client BNSF

0550 EMEMPLOYEES ARE ALL ON SITE
AND SETTING UP EQUIPMENT TO
OUTFIT BNSF EMPLOYEES WITH
PERSONAL PUMPS.

0600 BNSF SAFETY MEETING COMMENCES
TODAY EMR WILL MEET RP-21 AT
2nd JOB SITE AT CV 1339 LOW
SIDE LEFT RAIL MP 1339.5, 1300'
TIE UP AT YAKT, MP 1343.5
ACCESS - HWY 2 (W), RIGHT ON
HUNSMILL RD HOOK TO THE LEFT.
~2-5 WESTBOUND TRAINS TO WATCH

OSHA

FOR THIS MORNING.

START
TIME

NAME

SSN

JOB

SAMPLE
#

0622 DALE JOHNSON 5315 ASSISTANT
FOREMAN 43

0624 JODY CROW 5426 DECLIPPER 44

0625 CJ CAVEN 1405 LABORER 45

0627 BEN ROBERTSON 5372 ASSISTANT
FOREMAN 46

TODD HUT 2-11-08

0629 ARTHUR MCKEE 2451 OPERATOR 47

0631 DANIEL RODRIGUEZ 8874 OPERATOR 48

0659 EMR SAFETY MEETING
SOIL SAMPLING ACTIVITIES REQUIRE
LEVEL C PRE
NO CRIBBER TODAY (CONCRETE).

Location MP 1339.5 Date 9-24-08Project / Client BNSF

0857 WEATHER STATION UP & RUNNING
TEMP 47.3°F

WIND SPEED 0.6 MPH

FOGGY BUT THE SUN IS COMING
THROUGH A LITTLE BIT.

0907 PERIMETER PUMPS UP AND RUNNING

NOTE DEFUNKED GENERATOR IS NOW
WORKING AGAIN AFTER REPAIR
AT RICKS RENTAL IN LIBBY, MT.

0920 DAVE WELCH PLOTS OUT SOIL
SAMPLING LOCATIONS.

0953 SOIL SAMPLING BEGINS

0955

RR- 00047

SOIL SAMPLE #47

IS TAKEN

SHEET # 006111

SP- 138506

0955

NO VV SEEN

TEXTURE: CLAY/SILT/SAND WITH
COARSE GRAVEL. HARD PACKED

1002

RR- 00048

SOIL SAMPLE #48

IS TAKEN

SHEET # 006111

SP- 138507

1002 TEXTURE: SILTY SAND W/COARSE
GRAVEL

Location MP 1339.5Date 9-24-08Project / Client BNSF

1002 CS CAVEN (BNSF) WAS WEARING ONE OF OUR PERSONAL PUMPS. HE TOOK OFF THE PUMP & LEFT IT ON THE BACK OF A PIECE OF EQUIPMENT. ANOTHER BNSF EMPLOYEE FOUND THE PUMP & IS NOW WEARING IT. I WILL ADD HIS NAME WHEN I CAN GET IT. CS WAS WEARING SAMPLE #45.

1002 NO UV SEEN IN SOIL SAMPLE #48

1011

RR- 00049

SOIL SAMPLE #49

IS TAKEN

SHEET #006111

SP- 138508

TEXTURE: CLAY / SILT / SAND & A LITTLE

BIT OF BALLAST

1011

NO UV SEEN

RR- 00050

SOIL SAMPLE #50

IS TAKEN

SHEET #006112

SP- 138509

TEXTURE: SAME AS ABOVE

1011

LOW AMOUNT OF UV SEEN

Location MP 1339.5Date 9-24-08Project / Client BNSF

1027

RR- 00051

SOIL SAMPLE #51

IS TAKEN

SHEET #006112

SP- 138510

TEXTURE: SAME AS ABOVE BUT

OLDER / DARKER SOIL

1027

LOW UV SEEN

1037

RR- 00052

SOIL SAMPLE #52

IS TAKEN

SHEET #006112

SP- 138511

TEXTURE: SAME AS ABOVE

1037

LOW AMOUNT OF UV SEEN

1047

RR- 00053

SOIL SAMPLE #53

IS TAKEN

SHEET #006113

SP- 138512

TEXTURE: SAME AS ABOVE

1047

CAN SEE UV ON SURFACE OF SOIL

LOW UV SEEN AT DEPTH

1102

RR- 00054

SOIL SAMPLE #54

IS TAKEN

SHEET #006113

SP- 138513

1102 SOIL SAMPLE #54 TEXTURE: SAME AS BEFORE

1102 VV IS SEEN ON SURFACE SOIL
LOW VV SEEN AT DEPTH

1110 SOIL SAMPLE #55
RR- 00055 IS TAKEN
SHEET # 006114

SP- 138514

TEXTURE: SAME AS ABOVE

1110 VV IS SEEN ON SURFACE SOIL
LOW VV SEEN AT DEPTH

1135 GPS OF SOIL SAMPLE #49 IS TAKEN

1137 GPS OF SOIL SAMPLE PLOT #50 IS TAKEN

1138 GPS OF SOIL SAMPLE PLOT #51 IS TAKEN

1139 GPS OF SOIL SAMPLE PLOT #52 IS TAKEN

1140 GPS OF SOIL SAMPLE PLOT #53 IS TAKEN

1143 GPS OF SOIL SAMPLE PLOT #54 IS TAKEN

1144 GPS OF SOIL SAMPLE PLOT #55 IS TAKEN

NOTE ALL GPS RECORDINGS WERE TAKEN BY
MATT LENZ OF EMP.

1148 GPS OF STATIONARY PUMP TAKEN BA-00053

1149 GPS OF STATIONARY PUMP TAKEN BA-00052

1150 GPS OF STATIONARY PUMP TAKEN BA-00054

1151 GPS OF STATIONARY PUMP TAKEN BA-00055

NOTE THE NAME OF THE BNSF EMPLOYEE
THAT DOWNED CJ'S PUMP (#45)
WAS "SMILEY." THIS IS THE ONLY
INFORMATION WE WERE ABLE TO
GATHER.

1400 GML LEFT FOR CDM.

NO FURTHER ENTRIES
AMANDA THORNTON
9-24-08

tion TROY YARD TIE-UP RP-15 Date 9-25-08
Project / Client BNSF

Location MP 1341 Date 9-25-08
Project / Client BNSF

EMR EMPLOYEES ALL ARRIVE AT
TROY YARD TIE-UP TO MEET RP-15
GANG
BNSF SAFETY MEETING COMMENCES
1341 LEFT HIRSA 600' THEN
RP-15 WILL BE OUT OF CUL.
BNSF SAFETY MEETING CONCLUDES
STRETCHING BEGINS.

SAMPLES

NAME	SSN#	JOB # SSN# 9-25-08	SAMPLE #
JOSH SYNNOT	8473	LABORER	51
RYAN TUCKER	3932	LABORER	52
MIKE COSSART	8354	machine oper.	53
VICTOR BACHMIR	2767	machine oper.	54
RODNEY ZIMMERMAN	3662	LABORER	55
KAGEN COX	9430	LABORER	56

EMR ARRIVES AT MP 1341.
EMR SAFETY MEETING. LEVEL D PPE
6 HOUR TRAIL PROTECTION 0600-1000
WEATHER STATION UP & RUNNING.
TEMP 49.8°F
WIND SPEED 0.6 MPH
PERIMETER PUMPS UP & RUNNING.

0730 BNSF CREW BUS ARRIVES
0755 **RR- 00056** SOIL SAMPLE
#56 IS TAKEN
SHEET #00615
SP- 138515
0755 NO UV SEEN
TEXTURE: SANDY SILT WEATHERED
ROCK / BALLAST
0803 **RR- 00057** SOIL SAMPLE
#57 IS TAKEN
SHEET #00615
SP- 138516
TEXTURE: SAME AS ABOVE
0803 NO UV SEEN
0812 **RR- 00058** SOIL SAMPLE
#58 IS TAKEN
SHEET #00615
SP- 138517
TEXTURE: SAME AS ABOVE
0812 NO UV SEEN
0822 **RR- 00059** SOIL SAMPLE #59
IS TAKEN
SHEET #00616
SP- 138518

Location MP 1341Date 9-25-08Project / Client BNSF0822 ~~SO~~ ^{ACT 9-25-08} NO VV SEEN ON SAMPLE

#RR-00059

TEXTURE: SAME AS BEFORE

0833

RR- 00060

SOIL SAMPLE #60

IS TAKEN

SHEET #006116

SP- 138519

TEXTURE: SAME AS BEFORE

0833

NO VV SEEN

0844

RR- 00061

SOIL SAMPLE #61

IS TAKEN

SHEET #006116

SP- 138520

TEXTURE: SAND W/ LITTLE GRAVEL

NO VV SEEN

0848

RR- 00062

SOIL SAMPLE #62

IS TAKEN

SHEET #006117

SP- 138521

TEXTURE: SANDY W/ LITTLE GRAVEL

0848

NO VV SEEN

0918

GPS SAMPLE LOCATION OF #56 TAKEN

0919

GPS LOCATION OF SOIL SAMPLE #57 TAKEN

0920

GPS LOCATION OF SOIL SAMPLE #58 TAKEN

0922

GPS LOCATION OF SOIL SAMPLE #59 TAKEN

Location MP 1341Date 9-25-08Project / Client BNSF

0923 GPS OF SOIL SAMPLE #60 TAKEN

0924 GPS OF SOIL SAMPLE #61 TAKEN

0925 GPS OF SOIL SAMPLE #62 TAKEN

0927 GPS OF STATIONARY PUMP BA-00068

U BA-00067 TAKEN

0927 GPS OF STATIONARY PUMP BA-00066
TAKEN

0929 GPS OF STATIONARY PUMP BA-00063

U BA-00064 TAKEN

AD 0929 GPS OF STATIONARY PUMP BA-00065

0930 GPS OF WEATHER STATION TAKEN

0930 GPS OF STATIONARY PUMP #BA-00066
TAKENNOTE BEGAN RAINING NOW
ALL GPS LOCATIONS TAKEN BY
MATY LENZ OF GMR

Libby, MT & Troy, MT
BNSF Rail Maintenance
Activity Based Sampling
Fieldbook # 2 (ABS)

Start Date
09-17-08



"Rite in the Rain"

ALL-WEATHER
ENVIRONMENTAL

No. 550

"Rite in the Rain"
ALL-WEATHER WRITING PAPER



ALL-WEATHER
ENVIRONMENTAL FIELD BOOK

Name _____

Address _____

Phone _____

Project _____

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
Columnar	1/4" Grid	Item No. 550	Item No. 550F

CONTENTS.

[illegible]

Reference Page Index

147 Error codes, Hazardous classifications, Container types
148 Sampling guidelines (Liquids)
149 Sampling guidelines (Solids)
150 Approximate Volume of Water in Casing or Hole, Ground Water Monitoring Well
151 PVC Pipe casing tables
152 Soil Classification
153 Soil Classification
154 Conversions (Length, Weight, Volume, Temp, etc...)
155 Conversions (Concentrations, Volume/Flow or Time, Velocity, Acceleration)
156 Maximum Concentration of Contaminants for the Toxicity Characteristic

Project / Client BNSF-ROW

0600: Arrive at BNSF safety meeting
0630: Personal Pumps started for
(two) activity based samples & OSHA (six)
0700: EMR leaves safety meeting site
to Ripley MP-1312.
0710: EMR holds tailgate safety
meeting. Begin setting up
stationary pumps
0730: Generator not working properly.
Not enough power for south side
pumps
0735: North side pumps started
0747: Trespasser ABS samples started.
0830: Scott Carney leaves site to
return generator
0850 M. Lenz begins videotaping
track maintenance crew
0910: Scott C back on site with new
generator.
0915 Pumps on south side of track
* started
1035: Cribber passed pump areas
1144: Pumps check and rates unchanged
Ontonagon pump dropped from 2.8
to 2.5

Location MP 1312 Date 9/17/08Project / Client BNSF-ROW

1200: Pumps checked and rates are unchanged

1315 Anchor machine passes pumps

1250: stationary pump samples collected

1343 ML 9/17/08 Trespasser samples taken

1400 EMR offsite

ML 9/17/08

BA- 00001

ABS

started 0636 2.8 lpm
stopped 1436

ML 9/17/08

BA- 00002

ABS

started 0636 2.8 lpm
stopped 1436

ML 9/17/08

BA- 00003

ABS
0749 start 2.8 lpm
1348 stop 2.8 lpm

ML 9/17/08

BA- 00004

ABS

start 0749 2.8 lpm
stop 1343

ML 9/17/08

BA- 00005

ABS

0753 start 2.8 lpm
1400 stopped

ML 9/17/08

BA- 00006

0911 start 7.6 lpm
1305 stop

SP- 138440

ML 9/17/08

BA- 00007

0912 start 7.6 lpm
1304 stop

SP- 138441

Location MP-1312 Date 9/17/08Project / Client BNSF-ROW

ML 9/17/08

BA- 00008

0734 start
1255 stop 7.6 lpm

SP- 138442

ML 9/17/08

BA- 00009

0737 start
1253 stop 7.6 lpm

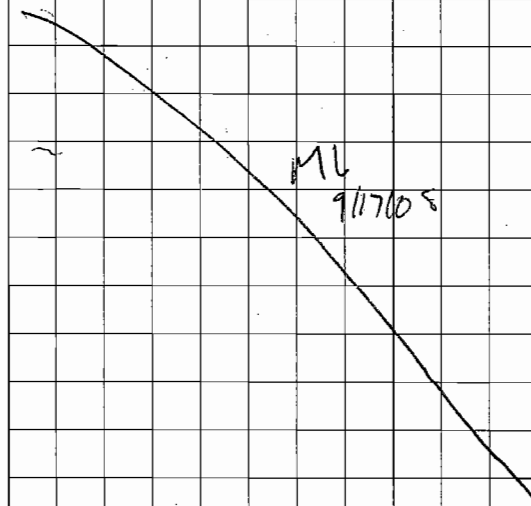
SP- 138443

ML 9/17/08

BA- 00010

Blank

ML 9/17/08



Location MP-1331.5 Date 9/18/08Project / Client BNSF-ROW

ML/	Engle Victor BA- 00011	0638 start 1502 stop	1.4 lpm
ML/	Victor Eric P BA- 00012	0648 start 1459 stop	1.4 Lpm
ML/	Dave BA- 00013	1000 start 1555 stop	2.8 Lpm
MY	Amanda BA- 00014	1000 start 1555 stop	start 2.8 stop 2.6
ML/	Matt BA- 00015	1015 start 1556 stop	started 2.8 stop 2.7
ML/	stationary BA- 00016	0958 start 1550 stop	7.6 Lpm
ML/	SP-138444 BA- 00017	0958 start 1550 stop	7.6 LPM
ML/	SP-138445 BA- 00018	1011 start 1545 stop	7.6 LPM
ML/	SP-138446 BA- 00019	1012 start 1544 stop	7.6 LPM
ML/	SP-138447 BA- 00020	Blank	

Location MP-1331.5Date 9/18/08Project / Client BNSF-ROW

0600	safety meeting at crossroads
0630	start activity based sampling
0700	Offsite
0730	Arrive at MP 1331.5
	EMR decides where sampling should occur, safety meeting
0745	EMR prepares for BNSF Track personnel to reach sampling area
0900	BNSF workers approaching
0930	Pumps (stationary) started
0950	Trespasser pumps started
1015	Tie pullers pass by
1030	Speed swing & plate puller pass
1100	J. Starr checks stationary pumps Flow Rates have not changed
1120	Tie plugger passes by
1130	Cribber passes by
1136	M. Lenz offsite to resolve GPS issues
1219	Rail reset crane to the end of work area 1st equipment to end since Cribber.

Location MP 1331.5 Date 9/18/08
 Project / Client BNSF-ROW

- 1300 M. Lenz returns and takes GPS coordinates of soil sample areas and stationary pumps
- 1340 Reset crane and welding truck stopped & have been for 30 minutes
- 1345 ABS pumps checked for flow rate
 Matt's pump at 2.7 Lpm
 Amanda's pump at 2.4 Lpm
 Dave's pump at 2.8 Lpm
- 1350: Train passes by
- 1400: ML GPS station
- 1540: Last of equipment passes
- 1545: Pull stationary samples
- 1556: Pull trespasser pump samples
- 1615: Downloaded Met Data to laptop
- 1630 off site

Location MP-1330.5 1331 Date 9/19/08
 Project / Client BNSF-ROW

- 0645: Arrive to BNSF safety meeting
- 0648: Start BNSF personal samples
- 0715: Train passes by
- 0720: Stationary pumps set up and started
- 0730: Trains have been passing on main work will begin shortly
- 0740: Speed swing
- 0750: Train passes on main
- 0808: Tie pulleys pass
- 0810: Workers cutting rail
- 0815: EMR soil sampling site location.
- 0820: EMR videotapes work
- 0830: M. Lenz checks personal pumps
 Amanda's pump dropped from 2.8 to 2.7 Lpm
 Dave & Matt's still at 2.8 Lpm
- J. Starr checks stationary pumps
- 0835: Rail moved off siding
- 0840: work has stopped due to inoperable machine
- 0850: Reset crane moves inoperable machine off siding
- 0900: Tie plugger passes soil sample
- 0940: Paul reset crane passes.
- 0941: welding truck passes

Location MD-1331 ML 9/19/08 Date 9/19/08
 Project / Client BNSF-ROW

0920: Dave Welch gives personal sample
 to John Starr, Dave leaves
 site to make phone call regarding
 next week

0945: Mlene takes GPS points at
 soil, Airg amphet, and Met station

0950: Spike ~~puller~~ passes
 ML
 9/19/08

1005: Anchor machine passes

1110: Spike magnet passes.

1130: CBM offsite

1135 Dave returns to site

1140 Last of equipment passes.

1150 EMR pulls stationary pumps

1200 EMR begins taking down equipment

1230: EMR pulls Trespasser samples

1300: EMR offsite

Location MD-1331 ML 9/19/08 Date 9/19/08
 Project / Client BNSF-ROW

BA-00021 start 0630 2.8 Lpm ML 9/23/08
 stop 1223

BA-00022 start 0628 2.8
 stop 1231

BA-00023 start 0648 2.8 Lpm
 stop 1231

BA-00024 start 0648 2.6 Lpm
 stop 1241

BA-00025 start 0648 2.8 Lpm
 stop 1241

BA-00026

SP-138448 0729 start 7.6 Lpm
 1147 stop

BA-00027 Blank

BA-00028 0729 start 7.6 Lpm
 1148 stop

SP-138449

Location MP-1329.8 ML 9/23/08 Date 9/22/08
 Project / Client BNSF
Rainy, cloudy. 54°F

0600:	safety meeting
0630:	started BNSF ABS personal pumps Flow 2.8 Lpm
0700:	Rain starts to fall. EMR goes offsite to determine if sampling is to be performed
0900:	OK to sample given by Scott Carney. Rain has stopped
0940:	M. Lenz & Amanda start trespassor pumps at 2.8 Lpm
0950:	EMR is in wrong location. work Thought to be at 1329 is more at 1329.5. EMR Moves to new location at 1328.
1050:	Dave & stationary ABS pumps started.
1100:	Anchor ^{puller} and speed swing have already passed.
1110:	Workers are grinding and blowing concrete ties
1120:	Rain starts
1130:	Amanda T. and Dave W. start sampling soil. Rain stopped
1159:	Rail Reset crane passes by

Location MP-1329.8 Date 9/22/08
 Project / Client BNSF ML 9/23/08

1210:	Welding truck passes by
1215:	M. Lenz checks personal pumps on trespassers. Mike's pump down to 2.7 lpm Amanda's pump 2.7 lpm Dave's pump 2.8 lpm
1220:	Rail anchors being set
1300:	Last of equipment passes
1318:	BNSF personal samples pulled
1458:	Pumps pulled EMR offsite

BA- 00029

start 0629 2.8
stop 1318 Lpm

BA- 00030

start 0629 2.8 lpm
stop 1318

BA- 00031

start 0941 2.6 lpm
stop 1435

BA- 00032

start 0946 2.7 Lpm
stop 1435

BA- 00033

start 1030 2.8 Lpm
stop 1425

BA- 00034

start 1051 7.6 Lpm
stop 1437

SP- 138450

Location MP-1329.8 Date 9/22/08
 Project / Client BNSF mr
9/23/08

BA- 00035

SP- 138451

BA- 00036

start 1057
 stop 1437 7.6 Lpm

Blank

Location MP-1337 Date 9/23/08
 Project / Client BNSF
Foggy, Cloudy 38°F

0600: Safety meeting Troy Depot
 0630: Pumps started
 0700: Move to location begin setup
 0720: All Trespasser pumps have been started
 0721: AT 0715 rail was already being cut.
 0727: South stationary pumps started
 0730: Spike puller passes
 0745: North side stationary pumps started
 0756: Anchor puller passes
 0815: Cooper passes
 0835: Rail expander passes
 0840: Cribber passes
 0849: Rail reset crane puts new rail in place
 0913: Spikers pass
 0920: ML checks Trespasser pumps.
 ML's pump down to 2.7 Lpm
 AT pump down to 2.7 Lpm
 DW pump down to 2.6 Lpm
 0930: ML checks pumps on North & South side of tracks (stationary)

Location MP-1337 Date 9/23/08Project / Client BNSF

940 The "bomb" passes by
 1000 AT&DW finish soil sampling
 015 Muenz takes GPS points
 of stationary pumps soil
 and met station
 1020 1 south side of track generator
 not working, can't restart
 BA-00043 & BA-00042
 Pump Fault
 1030 Last of equipment passes
 by
 1050 EMR begins take down
 1150 EMR pulls stationary and personals

BA- 00037

BA- 00038

BA- 00039

BA- 00040

BA- 00041

Location _____ Date _____

Project / Client _____

BA- 00042

SP- 138452

BA- 00043

SP- 138453

BA- 00044

SP- 138454

BA- 00045

SP- 138455

BA- 00046

Blank

124

Location MP-1339.5Date 9/24/08Project / Client BNSF48°F, cloudy

- 0600: BNSF safety meeting at Troy yard.
- 0620: ABS personnel started for BNSF personnel
- 0645: EMR will sample second stretch of track.
- 0710: EMR leaves to pick up fixed generator from Rick's Rental in Libby
- 0858: EMR onsite. Begins unpacking equipment.
- 0908: Personal Trespasser samples have been turned on running at 2.8 Lpm. Met station running
- 0912: stationary pumps running at 7.6 Lpm.
- 0915: Declipper machines pass by removing clips holding rail to concrete ties
- 0930: Magnet Machine passed by
- 0945: Rail reset crane passes by setting in new rail
- 1000: J. Starr checks stationary pumps. All running at 7.6 Lpm.

Location MP-1339.5Date 9/24/08Project / Client BNSF

- 1005: soil sampling started at 0930
- 1015: Leaf blower passes by cleaning of concrete ties. Visible dust.
- 1105: Grasper passes by
- 1115: Welding truck passes
- 1120: Tamper passes
- 1122: Amanda and Dale Welch finished sampling soil
- 1130: M. Lenz takes GPS points at soil locations and ABS stationary samples
- 1155: The bomb passes by. Anchors are set by workers. Machine follows and locks into place.
- 1225: Last of equipment passes
- 1309: J. Starr ~~now~~ goes to Yank yard to take ~~off~~ ^{off} ABS
- 1500: EMR OFFsite

ML
9/24/08
ML
9/24/08
ML
9/24/08
ML
9/24/08

BA- 00047

BA- 00048

BA- 00049

BA- 00050

start	1309	0617	2.8 Lpm
stop	1309		
start	0619		2.8 Lpm
stop	1315		
start	0907		2.7 Lpm
stop	1359		
start	0907		2.7 Lpm
stop	1400		

Location MP-1339.5 Date 9/24/08Project / Client BNSF

BA- 00051

start 0907
stop 1400 2.7 Lpm

BA- 00052

0909 start
stop 1243 7.6 Lpm

SP- 138456

BA- 00053

start 0910
stop 1243 7.6 LpmML
9/24/08
SP- 138457

BA- 00054

start 0911
stop 1246 7.6 Lpm

SP- 138458

BA- 00055

start 0911
stop 1246 7.6 Lpm

SP- 138459

BA- 00056

Field Blank

BA- 00057

Lot Blank

Location MP-1341Date 9/25/08Project / Client BNSF

48°F, Cloudy,

BA- 00058

start 0623
stop 0925 2.8 Lpm

BA- 00059

start 0625
stop 0924 2.8 Lpm

BA- 00060

start 0653
stop 1030 2.8 Lpm

BA- 00061

start 0655
stop 1040 2.8 Lpm

BA- 00062

start 0656
stop 1031 2.8 Lpm

BA- 00063

start 0728
stop 1002 7.6 Lpm

SP-138460

BA- 00064

CO located sample
start 0728
stop 1002 7.6 Lpm

SP-138460

BA- 00065

start 0728
stop 1003 7.6 Lpm

SP-138461

BA- 00066

start 0725
stop 0959 7.6 Lpm

SP-138462

Location MP-1341Date 9/25/08Project / Client BNSF**BA- 00067**

SP-138463

start 0725

stop 1000

7.6 rpm

BA- 00068

SP-138463

co located sample

start 0725

stop 1000

7.6 rpm

0600 BNSF safety meeting at Troy yard
 0620 ABS samples started on BNSF workers
 0700 Arrive at MP-1341 start Trespasser
 ABS samples. set up weather
 station. safety meeting
 0725 start stationary samples
 BA-00064 & BA-00068
 are co-located samples
~~0730~~ 0730 EMR starts soil sampling
 0731 Clip supply passes to the west
 0732 Declipper passes
 0738 Declipper passes
 0745 speed swing passes to east
 0749 speed swing passes to west
 0757 crew prepping ties
 0805 Gooper passes
 0824 welding truck passes

Location _____

Date _____

Project / Client _____

0848

Bomb, ^{passes} spiker

0853

spiker passes

BA- 00069

Field Blank

0900

Magnet machine passes

0920

All machines passed

0930

Starts raining

0931

Pumps checked for flow

0

Atlantic's 2.8

M. Lenz 2.8

Taves 2.7

All stations ~~2.7~~ 2.6 L/min

1000

stationary pump samples
pulled

1030

Met station downloaded
Rain stopped light mist, rain
did not accumulate

ABS personals pulled

1040

Personal Trespasser pumps pulled

1050

Final cleanup

1059

EMR off site

Video Log

Disc Time

9/17/08 MP-1312

Disc 1

.01 sec BNSF safety meeting
 26 sec Pumps (ABS) assigned to rail workers

43 sec Air Monitoring Area

1.00 min spike puller

1.3 min crew working

23 min cribber machine

3 min cribber passing

4.20 min Rail reset crane

6.36 min Rail work

7.3 min line of machines

8.4 min Anchor machine

8.41 min Magnet pulling spikes For Scrap

9.3 min soil samples

9/18/08 MP-1331.5

9.41 Rail reset crane

10.4 Trespasser start sampling

11.24 360° view sampling Area road work

12.20 speed swing

12.50 Ballast being moved

13.56 Rail work

14.04 Trespassers (real) on tracks

Video Log (cont.)

9/18/08 1331.5

Disc 1

15.39 min welding Truck
 15.5 Air Sampling Area
 Met station

18.01 - Train passing

18.22 worker with pump

18.40 spiker machine magnet passing

9/19/08 MP-1331

19.15 Met station location

20.05 360° view of sample Area

20.50 worker cutting rail

21.19 Rail Maintenance

9/22/08 MP-1331

Disc 2

.01 sec soil samplers

.21 south side of rail not
 Air sampled

.56 Rail Reset crane

1.15 Rail Maintenance

1.59 Machine inoperable (hydraulic line)

2.29 Crane removing machine

5.45 Ballast being moved

6.06 Grinding rail - welding Truck

Location _____ Date _____

Project / Client Video Log

9/22/08 MP-1329.8

8.09 360° view of sampling Area
 8.40 workers using leaf blower
 9.10 Air samples
 9.30 Rail work
 1000 Mile post location

9/23/08 MP-1337

1001 360° of work Area
 1030 spike puller
 1130 Goopers applying adhesive
 1140 Rail work
 1200 The 'Bomb' machine

9/24/08 MP-1339.5

1230 Anchor puller/Declipper
 1300 360° of work area
 1400 Goopers
 1430 The bomb machine
 1450 workers putting clips on ties

9/25/08 MP-1341

1500 360° of work area
 1550 Declipper
 1630 Rail work
 1712 soil samplers
 1730 rail reset crane
 1740 The bomb

Location _____ Date _____

Project / Client _____

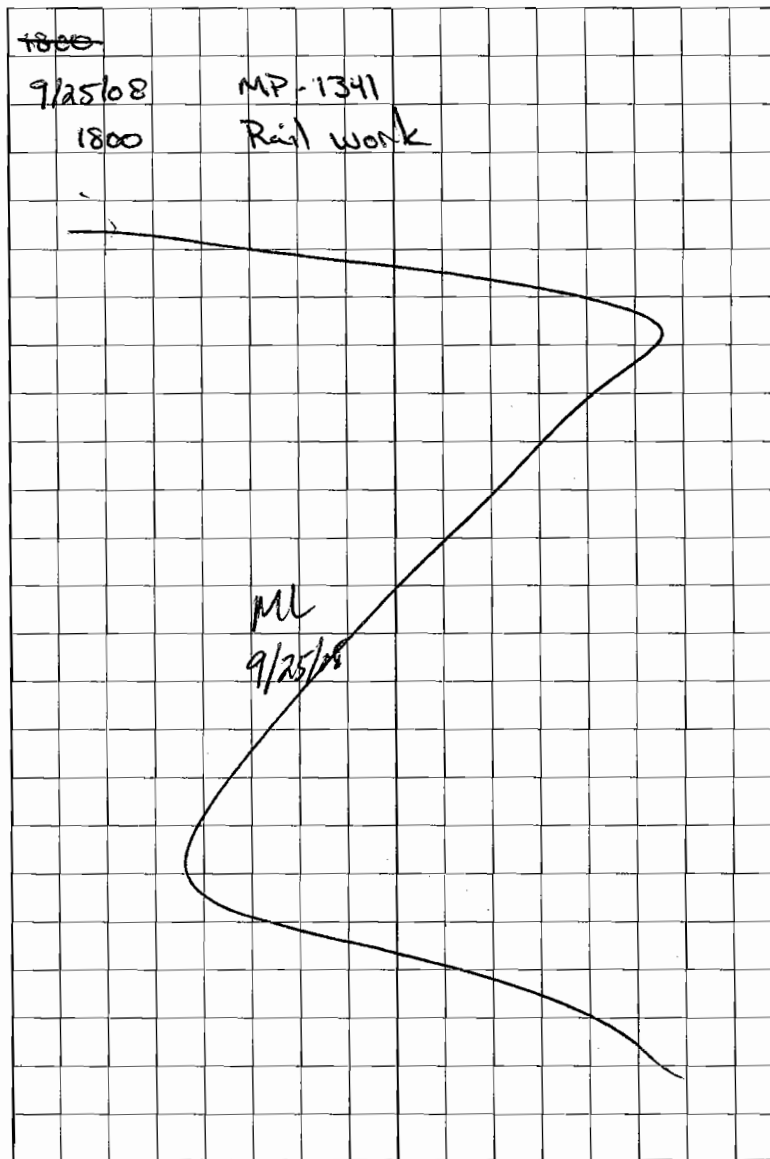
~~1800~~

9/25/08

MP-1341

1800

Rail work

ML
9/25/08



APPENDIX C

FIELD SAMPLING DATA SHEETS – AIR

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 550-1 Page No. 6 Sampling Date: 9/17/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: GDM Other EMR Names: MC
 Person Sampled/Co. Name: ERIC PAYLACK / BNSF SSN: 0145 Task: LABORER

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00001		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP 1312		
Category (circle)	<input checked="" type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	<input type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	<input type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)
Matrix Type (circle)	Indoor <input checked="" type="radio"/> Outdoor	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<input checked="" type="radio"/> 25mm <input type="radio"/> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- 45 <input checked="" type="radio"/> PCM- 0.8	TEM- 45 PCM- 0.8	TEM- 45 PCM- 0.8
Flow Meter Type (circle)	<input checked="" type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	4091		
Flow Meter ID No.	VFB-65		
Start Date	9/17/08		
Start Time	0636		
Start Flow (L/min)	2.8 Lpm		
Stop Date	9/17/08		
Stop Time	1436		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	<input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	No Yes NA	No Yes NA
MET Station onsite?	No <input checked="" type="radio"/> Yes <input type="radio"/> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <input checked="" type="radio"/> NA	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
	Volpe: Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated
Entered (LFO)			

For Field Team Completion
(Provide Initials) **MC**

Completed by **MC**

QC by

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 550 Page No: 6 Sampling Date: 9/17/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other EMR Names: _____
 Person Sampled/Co. Name: Victor Bachmeier / BNSF SSN: 2767 Task: CRIB OPERATOR

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00002		
Location ID	<u>AD- 005568</u>		
Sample Group	<u>Property</u>		
Location Description	<u>MP 1312</u>		
Category (circle)	<input checked="" type="radio"/> FS <input type="radio"/> FB-(field blank) <input type="radio"/> LB-(lot blank)	FS <input type="radio"/> FB-(field blank) <input type="radio"/> LB-(lot blank)	FS <input type="radio"/> FB-(field blank) <input type="radio"/> LB-(lot blank)
Matrix Type (circle)	Indoor <input checked="" type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor
Filter Diameter (circle)	<input checked="" type="radio"/> 25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm
Pore Size (circle)	TEM- .45 <input checked="" type="radio"/> PCM- 0.8	TEM- .45 <input type="radio"/> PCM- 0.8	TEM- .45 <input type="radio"/> PCM- 0.8
Flow Meter Type (circle)	<input checked="" type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input type="radio"/> DryCal <input type="radio"/> NA
Pump ID Number			
Flow Meter ID No.	<u>UFB-65</u>		
Start Date	<u>9/17/08</u> <u>9/17/08</u>		
Start Time	<u>636</u> <u>1432</u>		
Start Flow (L/min)	<u>2.8 L/min</u> <u>2.8</u>		
Stop Date			
Stop Time	<u>1432</u>		
Stop Flow (L/min)	<u>2.8</u>		
Pump fault? (circle)	<input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
MET Station onsite?	No <input checked="" type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
Sample Type	TWA <input type="radio"/> EXC <input checked="" type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA
Field Comments			
Cassette Lot Number: _____			
	Archive Blank (circle): Yes <input type="radio"/> No <input type="radio"/>	Archive Blank (circle): Yes <input type="radio"/> No <input type="radio"/>	Archive Blank (circle): Yes <input type="radio"/> No <input type="radio"/>
Entered (LFO) _____	Volpe: _____ Entered _____ Validated _____	Volpe: _____ Entered _____ Validated _____	Volpe: _____ Entered _____ Validated _____

 For Field Team Completion
 (Provide Initials)

Completed by

QC by

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No: 1 Page No: 6 Sampling Date: 9/17/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway (Other) ROW
 Sampling Team: CDM Other EMR Names: _____

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00010		
Location ID	<u>Blank</u>		
Sample Group	<u>Property</u> ^{AL 11/10/08} <u>Blank</u>	<u>Property</u>	<u>Property</u>
Location Description	<u>Blank</u>		
Category (circle)	FS <u>FB (field blank)</u> LB (lot blank) DB (prep-dry blank)	FS <u>FB (field blank)</u> LB (lot blank) DB (prep-dry blank)	FS <u>FB (field blank)</u> LB (lot blank) DB (prep-dry blank)
Matrix Type (circle)	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> NA
Filter Diameter (circle)	<u>25mm</u> 37mm	<u>25mm</u> 37mm	<u>25mm</u> 37mm
Pore Size (circle)	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>
GPS Status (circle)	Collected Previously Collected Not Collected-no signal (3 attempts) <u>Not Collected-not required for sample</u>	Collected Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample	Collected Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample
GPS File (fill in or circle)	Filename: _____ NA	Filename: _____ NA	Filename: _____ NA
Flow Meter Type (circle)	Rotometer DryCal <u>NA</u>	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number			
Flow Meter ID No.			
Start Date			
Start Time			
Start Flow (L/min)			
Stop Date			
Stop Time			
Stop Flow (L/min)			
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
MET Station onsite? (circle)	No <u>Yes</u> NA	No <u>Yes</u> NA	No <u>Yes</u> NA
Sample Type (circle)	Pre Post Clear 2 nd Clear 3 rd Clear NA	Pre Post Clear 2 nd Clear 3 rd Clear NA	Pre Post Clear 2 nd Clear 3 rd Clear NA
Field Comments			
Cassette Lot Number:			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO): _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 2 Page No: 4 Sampling Date: 9/18/08
 Address: BNSF-ROW Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other EMR Names: Math Lenz
 Person Sampled/Co. Name: Victor Schneider / BNSF SSN: 2767 Task: Crib operator

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00011		
Location ID	AD-005568		
Sample Group	Property		
Location Description	Libby - MP1331.5		
Category (circle)	<u>FS</u> FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- .45 <u>PCM- 0.8</u>	TEM- .45 PCM- 0.8	TEM- .45 PCM- 0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal <u>NA</u>	Rotometer DryCal NA
Pump ID Number	4098		
Flow Meter ID No.	VFB-65		
Start Date	9/18/08		
Start Time	0648 0638		
Start Flow (L/min)	1.4		
Stop Date	9/18/08		
Stop Time	1502		
Stop Flow (L/min)	1.4		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>NA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: 7198170164			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO) _____	Volpe: _____ Entered _____ Validated _____	Volpe: _____ Entered _____ Validated _____	Volpe: _____ Entered _____ Validated _____

 For Field Team Completion
 (Provide Initials)
Completed by **ML**QC by **SLC**

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 2 Page No: 4 Sampling Date: 9/18/08
 Address: BNSF-ROW Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other EMR Names: Math Lenz
 Person Sampled/Co. Name: Eric Paulack / BNSF SSN: 0145 Task: Laborer

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00012		
Location ID	AD-005568		
Sample Group	Property		
Location Description	Libby - MP 1331.5		
Category (circle)	<u>FS</u> FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- .45 <u>PCM- 0.8</u>	TEM- .45 PCM- 0.8	TEM- .45 PCM- 0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	1091		
Flow Meter ID No.	VFB-65		
Start Date	9/18/08		
Start Time	0648		
Start Flow (L/min)	1.4		
Stop Date	9/18/08		
Stop Time	1459		
Stop Flow (L/min)	1.4		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>NA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: <u>719870164</u>			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO) _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

 For Field Team Completion
 (Provide Initials)
Completed by MLQC by SJC

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No: 2 Page No: 4 Sampling Date: 9/18/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (ROW)

Sampling Team: CDM Other EMR Names: John Starr, Scott Carney

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	<u>ML 9/18/08</u> BA- 00019	BA- 00020	
Location ID	SP- 138447	Blank	
Sample Group	Property	Blank	
Location Description	MP1331.5	Blank	
Category (circle)	<u>FS</u> FB-(field blank) LB-(lot blank) DB-(prep-dry blank)	<u>FS</u> <u>FB-(field blank)</u> LB-(lot blank) DB-(prep-dry blank)	<u>FS</u> <u>FB-(field blank)</u> LB-(lot blank) DB-(prep-dry blank)
Matrix Type (circle)	Indoor <u>Outdoor</u> NA	Indoor Outdoor <u>NA</u>	Indoor Outdoor NA
Filter Diameter (circle)	<u>25mm</u> 37mm	<u>25mm</u> 37mm	25mm 37mm
Pore Size (circle)	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>	TEM- .45 PCM- 0.8
GPS Status (circle)	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected-not required for sample	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) <u>Not Collected- not required for sample</u>	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample
GPS File (fill in or circle)	Filename: <u>BNSF-ROW</u> NA	Filename: <u>BNSF-ROW</u> NA	Filename: <u>BNSF-ROW</u> NA
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	<u>802365</u>		
Flow Meter ID No.	<u>PFKS-1</u>		
Start Date	<u>9/18/08</u>		
Start Time	<u>1012</u>		
Start Flow (L/min)	<u>7.6</u>		
Stop Date	<u>9/18/08</u>		
Stop Time	<u>1544</u>		
Stop Flow (L/min)	<u>7.6</u>		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite? (circle)	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type (circle)	Pre Post Clear 2 nd Clear 3 rd Clear <u>NA</u>	Pre Post Clear 2 nd Clear 3 rd Clear <u>NA</u>	Pre Post Clear 2 nd Clear 3 rd Clear NA
Field Comments			
Cassette Lot Number: <u>719870164</u>			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO): _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

For Field Team Completion (Provide Initials)

Completed by: MLQC by: SJC

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 2 Page No: 11 Sampling Date: 9/19/08
 Address: BNSF-ROW Owner/Tenant: BNSF
 Business Name: N/A
 Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other EMR Names: Math Lenz
 Person Sampled/Co. Name: Eric Paulack / BNSF SSN: 0145 Task: laborer

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00021		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP 1330.5 (33) ML 9/19/08		
Category (circle)	<input checked="" type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)
Matrix Type (circle)	Indoor <input type="radio"/> <input checked="" type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor <input type="radio"/>	Indoor <input type="radio"/> Outdoor <input type="radio"/>
Filter Diameter (circle)	<input checked="" type="radio"/> 25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm
Pore Size (circle)	TEM- 45 <input type="radio"/> <input checked="" type="radio"/> PCM- 0.8	TEM- 45 <input type="radio"/> PCM- 0.8	TEM- 45 <input type="radio"/> PCM- 0.8
Flow Meter Type (circle)	<input checked="" type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input type="radio"/> DryCal <input type="radio"/> NA
Pump ID Number	4100		
Flow Meter ID No.	VFB-65		
Start Date	9/19/08		
Start Time	0630		
Start Flow (L/min)	2.8		
Stop Date	9/19/08		
Stop Time	1223		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	<input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
MET Station onsite?	No <input checked="" type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
Sample Type	TWA <input type="radio"/> EXC <input checked="" type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA
Field Comments			
Cassette Lot Number	7198170164		
Archive Blank (circle): Yes No			
Volpe:			
Entered (LFO) Entered Validated			

For Field Team Completion
(Provide Initials)

Completed by

QC by

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 2 Page No. 11 Sampling Date: 9/19/08
 Address: BNSF Row Ownership: BNSF
 Business Name: N/A
 Land Use: Residential School Commercial Mining Roadway Other (Row)
 Sampling Team: CDM Other EMR Names: Mark Lenz
 Person Sampled/Co. Name: Vitor Bachmeier ^{9/19/08} BNSF SSN: 2167 Task: Crib operator

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00022		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP 1330.5 1331 ML 9/19/08		
Category (circle)	<input checked="" type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)
Matrix Type (circle)	Indoor <input checked="" type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor
Filter Diameter (circle)	<input checked="" type="radio"/> 25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm
Pore Size (circle)	TEM- 45 <input checked="" type="radio"/> PCM- 0.8	TEM- 45 <input type="radio"/> PCM- 0.8	TEM- 45 <input type="radio"/> PCM- 0.8
Flow Meter Type (circle)	<input checked="" type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input type="radio"/> DryCal <input type="radio"/> NA
Pump ID Number	4018		
Flow Meter ID No.	VFB-65		
Start Date	9/19/08		
Start Time	0528 0628		
Start Flow (L/min)	2.8		
Stop Date	9/19/08		
Stop Time	1231		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	<input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
MET Station onsite?	No <input checked="" type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
Sample Type	TWA <input type="radio"/> EXC <input checked="" type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA
Field Comments			
Cassette Lot Number	7198170164		
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO)	Volpe: Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated

For Field Team Completion
(Provide Initials)

Completed by

QC by

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No: 2 Page No: 11 Sampling Date: 9/19/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (ROW) (ROW)
 Sampling Team: CDM Other EMR Names: Sohn Starr, Dave Welch

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	<u>9-19-08</u> BA- 00026	<u>9-19-08</u> BA- 00027	<u>9-19-08</u> BA- 00028
Location ID	SP- 138448	<u>Blank</u>	SP- 138449
Sample Group	<u>Property</u>	<u>Blank</u>	<u>Property</u>
Location Description	<u>MP-1330.5 133</u> <u>ML</u> <u>9/19/08</u>	<u>Blank</u>	<u>MP-1330.5</u> <u>ML</u> <u>9/19/08</u>
Category (circle)	<u>FS</u> FB (field blank) LB (lot blank) DB (prep-dry blank)	<u>FS</u> <u>FB (field blank)</u> LB (lot blank) DB (prep-dry blank)	<u>FS</u> FB (field blank) LB (lot blank) DB (prep-dry blank)
Matrix Type (circle)	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> NA
Filter Diameter (circle)	<u>25mm</u> 37mm	<u>25mm</u> 37mm	<u>25mm</u> 37mm
Pore Size (circle)	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>
GPS Status (circle)	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected-not required for sample	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) <u>Not Collected- not required for sample</u>	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample
GPS File (fill in or circle)	Filename: <u>BNSF-ROW</u> NA	Filename: <u>NA</u>	Filename: <u>BNSF-ROW</u> NA
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	<u>Rotometer</u> DryCal NA	<u>Rotometer</u> DryCal NA
Pump ID Number	<u>6401</u>		<u>8369</u>
Flow Meter ID No.	<u>PFKS-1</u>		<u>PFKS-1</u>
Start Date	<u>9/19/08</u>		<u>9/19/08</u>
Start Time	<u>0729</u>		<u>0729</u>
Start Flow (L/min)	<u>7.6</u>		<u>7.6</u>
Stop Date	<u>9/19/08</u>		<u>9/19/08</u>
Stop Time	<u>1147</u>		<u>1148</u>
Stop Flow (L/min)	<u>7.6</u>		<u>7.6</u>
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	<u>No</u> Yes NA
MET Station onsite? (circle)	No <u>Yes</u> NA	No Yes NA	No <u>Yes</u> NA
Sample Type (circle)	Pre Post Clear 2 nd Clear 3 rd Clear <u>NA</u>	Pre Post Clear 2 nd Clear 3 rd Clear NA	Pre Post Clear 2 nd Clear 3 rd Clear <u>NA</u>
Field Comments			
Cassette Lot Number: <u>719817064</u>			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO): _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

For Field Team Completion (Provide Initials)

Completed by: MLQC by: DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 2 Page No. 13 Sampling Date: 9/22/08
 Address: DNSF-Row Owner/Tenant: DNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (Row)
 Sampling Team: CDM Other EMR Names: Math Lenz
 Person Sampled/Co. Name: Eric Paulack/DNSF SSN: 0145 Task: Labaner

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00029		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP 1329 1328 1329.8 ML 7/22/08		
Category (circle)	<input checked="" type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)
Matrix Type (circle)	Indoor <input checked="" type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor
Filter Diameter (circle)	<input checked="" type="radio"/> 25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm	25mm <input type="radio"/> 37mm
Pore Size (circle)	TEM-45 <input checked="" type="radio"/> PCM-0.8	TEM-45 <input type="radio"/> PCM-0.8	TEM-45 <input type="radio"/> PCM-0.8
Flow Meter Type (circle)	<input checked="" type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input checked="" type="radio"/> DryCal <input type="radio"/> NA	Rotometer <input type="radio"/> DryCal <input type="radio"/> NA
Pump ID Number	4099		
Flow Meter ID No.	UFB-65		
Start Date	9/22/08		
Start Time	0629		
Start Flow (L/min)	2.8		
Stop Date	9/22/08		
Stop Time	1318		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	<input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
MET Station onsite?	No <input checked="" type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA	No <input type="radio"/> Yes <input type="radio"/> NA
Sample Type	TWA <input type="radio"/> EXC <input checked="" type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA
Field Comments			
Cassette Lot Number	7198170164		
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO)	Volpe: Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated

For Field Team Completion
(Provide Initials)

Completed by ML

QC by DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 2 Page No. 13 Sampling Date 9/22/08
 Address BNSF ROW Owner/Tenant BNSF
 Business Name NA
 Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other ENR Names Mark Lenz
 Person Sampled/Co. Name Victor Buchmeier / BNSF SSN 2767 Task Crib operator

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00030		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP 1329 1328 1329.8 ML 9/22/08		
Category (circle)	<u>FS</u> FB (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM-45 <u>PCM-0.8</u>	TEM-45 PCM-0.8	TEM-45 PCM-0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	4098		
Flow Meter ID No.	UFB-65		
Start Date	9/22/08		
Start Time	0629		
Start Flow (L/min)	2.8		
Stop Date	9/22/08		
Stop Time	1318		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>INA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: <u>7198170164</u>			
Archive Blank (circle): Yes No	Yes No	Yes No	Yes No
Volpe:			
Entered (LFO) _____	Entered _____ Validated _____	Entered _____ Validated _____	Entered _____ Validated _____

For Field Team Completion
(Provide Initials)

Completed by MLQC by DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No: 2 Page No: 13/14 Sampling Date: 9/22/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other EMR Names: MATT LEHZE, JOHN STARR

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	<u>BA- 00034</u>	<u>BA- 00035</u>	<u>BA- 00036</u>
Location ID	<u>SP- 138450</u>	<u>SP- 138451</u>	<u>Blank</u>
Sample Group	<u>Property</u>	<u>Property</u>	<u>Property</u>
Location Description	<u>MP 1329 1329.8</u> <u>1328 ML 9/22/08</u>	<u>MP 1329 1329.8</u> <u>1328 ML 9/22/08</u>	<u>Blank</u>
Category (circle)	<u>FS</u> FB-(field blank) LB-(lot blank) DB-(prep-dry blank)	<u>FS</u> FB-(field blank) LB-(lot blank) DB-(prep-dry blank)	<u>FS</u> FB-(field blank) LB-(lot blank) DB-(prep-dry blank)
Matrix Type (circle)	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> NA
Filter Diameter (circle)	<u>25mm</u> 37mm	<u>25mm</u> 37mm	<u>25mm</u> 37mm
Pore Size (circle)	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>
GPS Status (circle)	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected-not required for sample	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample
GPS File (fill in or circle)	Filename: <u>BNSF-ROW</u> NA	Filename: <u>BNSF-ROW</u> NA	Filename: <u>NA</u>
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	<u>Rotometer</u> DryCal NA	<u>Rotometer</u> DryCal NA
Pump ID Number	<u>6401</u>	<u>8369</u>	
Flow Meter ID No.	<u>PFK5-1</u>	<u>PFK5-1</u>	
Start Date	<u>9/22/08</u>	<u>9/22/08</u>	
Start Time	<u>1051</u>	<u>1051</u>	
Start Flow (L/min)	<u>7.6</u>	<u>7.6</u>	
Stop Date	<u>9/22/08</u>	<u>9/22/08</u>	
Stop Time	<u>1437</u>	<u>1437</u>	
Stop Flow (L/min)	<u>7.6</u>	<u>7.6</u>	
Pump fault? (circle)	<u>No</u> Yes NA	<u>No</u> Yes NA	No Yes NA
MET Station onsite? (circle)	No <u>Yes</u> NA	No <u>Yes</u> NA	No <u>Yes</u> NA
Sample Type (circle)	Pre Post Clear <u>2nd Clear 3rd Clear NA</u>	Pre Post Clear <u>2nd Clear 3rd Clear NA</u>	Pre Post Clear <u>2nd Clear 3rd Clear NA</u>
Field Comments			
Cassette Lot Number: <u>7198170164</u>			
Entered (LFO):	Volpe: Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated

For Field Team Completion (Provide Initials)

Completed by: MLQC by: DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 2 Page No. 16 Sampling Date 9/23/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential ☐ School ☐ Commercial ☐ Mining ☐ Roadway ☒ Other (ROW) ☐
 Sampling Team: CDM ☐ Other ☒ EMR Names: Math
 Person Sampled/Co. Name: Math Stashick / BNSF SSN: 7132 Task: Laborer

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00037		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP-1337		
Category (circle)	<input checked="" type="radio"/> FS FB (field blank) LB (lot blank)	<input type="radio"/> FS FB (field blank) LB (lot blank)	<input type="radio"/> FS FB (field blank) LB (lot blank)
Matrix Type (circle)	Indoor <input type="radio"/> Outdoor <input checked="" type="radio"/>	Indoor <input type="radio"/> Outdoor <input type="radio"/>	Indoor <input type="radio"/> Outdoor <input type="radio"/>
Filter Diameter (circle)	<input checked="" type="radio"/> 25mm <input type="radio"/> 37mm	<input type="radio"/> 25mm <input type="radio"/> 37mm	<input type="radio"/> 25mm <input type="radio"/> 37mm
Pore Size (circle)	TEM-45 <input type="radio"/> PCM-0.8 <input checked="" type="radio"/>	TEM-45 <input type="radio"/> PCM-0.8 <input checked="" type="radio"/>	TEM-45 <input type="radio"/> PCM-0.8 <input type="radio"/>
Flow Meter Type (circle)	<input checked="" type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	<input type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	<input type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA
Pump ID Number	40		
Flow Meter ID No.	VEB-65		
Start Date	9/23/08		
Start Time	0640		
Start Flow (L/min)	0640 2.4		
Stop Date	9/23/08		
Stop Time	1148		
Stop Flow (L/min)	2.4		
Pump fault? (circle)	<input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA
MET Station onsite?	<input type="radio"/> No <input checked="" type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA
Sample Type	TWA <input type="radio"/> EXC <input checked="" type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA
Field Comments			
Cassette Lot Number: 7198170164			
Archive Blank (circle): Yes No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
Volpe: Entered Validated	<input type="checkbox"/> Entered <input type="checkbox"/> Validated	<input type="checkbox"/> Entered <input type="checkbox"/> Validated	<input type="checkbox"/> Entered <input type="checkbox"/> Validated

For Field Team Completion
(Provide Initials)

Completed by MLQC by DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 2 Page No. 16 Sampling Date 9/23/08
 Address BNSF ROW Owner/Tenant BNSF
 Business Name NA
 Land Use: Residential ☐ School ☐ Commercial ☐ Mining ☐ Roadway ☒ (Other Row)
 Sampling Team: CDM ☒ Other EMR Names: Mitch Herz
 Person Sampled/Co Name: Dale Johnson / BNSF SSN: 5315 Task: crit operator

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00038		
Location ID	<u>AD-005568</u>		
Sample Group	<u>Property</u>		
Location Description	<u>MP-1337</u>		
Category (circle)	<input checked="" type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	<input type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)	<input type="radio"/> FS <input type="radio"/> FB (field blank) <input type="radio"/> LB (lot blank)
Matrix Type (circle)	Indoor <input type="radio"/> <input checked="" type="radio"/> Outdoor	Indoor <input type="radio"/> Outdoor <input type="radio"/>	Indoor <input type="radio"/> Outdoor <input type="radio"/>
Filter Diameter (circle)	<input checked="" type="radio"/> 25mm <input type="radio"/> 37mm	<input type="radio"/> 25mm <input type="radio"/> 37mm	<input type="radio"/> 25mm <input type="radio"/> 37mm
Pore Size (circle)	TEM-45 <input type="radio"/> <input checked="" type="radio"/> PCM-0.8	TEM-45 <input type="radio"/> PCM-0.8 <input type="radio"/>	TEM-45 <input type="radio"/> PCM-0.8 <input type="radio"/>
Flow Meter Type (circle)	<input checked="" type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	<input type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA	<input type="radio"/> Rotometer <input type="radio"/> DryCal <input type="radio"/> NA
Pump ID Number	<u>4099</u>		
Flow Meter ID No	<u>UFB-65</u>		
Start Date	<u>9/23/08</u>		
Start Time	<u>0631</u>		
Start Flow (L/min)	<u>2.8</u>		
Stop Date	<u>9/23/08</u>		
Stop Time	<u>1149</u>		
Stop Flow (L/min)	<u>2.8</u>		
Pump fault? (circle)	<input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA
ET Station onsite?	<input type="radio"/> No <input checked="" type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> NA
Sample Type	TWA <input type="radio"/> EXC <input checked="" type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA	TWA <input type="radio"/> EXC <input type="radio"/> NA
Field Comments			
Cassette Lot Number <u>7118170164</u>			
Archive Blank (circle)	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No
Volpe			
Entered (LFO)	<input type="radio"/> Entered <input type="radio"/> Validated	<input type="radio"/> Entered <input type="radio"/> Validated	<input type="radio"/> Entered <input type="radio"/> Validated

For Field Team Completion
(Provide Initials)

Completed by ML

QC by DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 2 Page No. 16 Sampling Date: 9/23/08
 Address: BNSF-ROW Owner/Tenant: BNSF
 Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (Row)

Sampling Team: CDM Other EMR Names: Mathew

Person Sampled/Co. Name: Mathew / EMR SSN: 2806 Task: onlooker/responder

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00039		
Location ID	<u>AD-005568</u>		
Sample Group	<u>Property</u>		
Location Description	<u>MP-1337</u>		
Category (circle)	<u>FS</u> FB (field blank) LB (lot blank)	<u>FS</u> FB (field blank) LB (lot blank)	<u>FS</u> FB (field blank) LB (lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor <u>Outdoor</u>	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm <u>37mm</u>	25mm 37mm
Pore Size (circle)	TEM- 45 <u>PCM-0.8</u>	TEM- 45 PCM-0.8	TEM- 45 PCM-0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	<u>4100</u>		
Flow Meter ID No.	<u>VFB-6.5</u>		
Start Date	<u>9/23/08</u>		
Start Time	<u>0653</u>		
Start Flow (L/min)	<u>2.8</u>		
Stop Date	<u>9/23/08</u>		
Stop Time	<u>1150</u>		
Stop Flow (L/min)	<u>2.7</u>		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>NA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: <u>7198170164</u>			
Archive Blank (circle): Yes No	Yes No	Yes No	Yes No
Volpe:			
Entered (LFO)	Entered Validated	Entered Validated	Entered Validated

For Field Team Completion
(Provide Initials)

Completed by MC

QC by DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 2 Page No: 17 Sampling Date: 9/24/08
 Address: BNSF-Row Owner Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (Row)
 Sampling Team: CDM Other EMR Names: Matt Lenz
 Person Sampled/Co. Name: Matt Stashick / BNSF SSN: 7132 Task: Laborer

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	<u>ML</u> <u>9/24/08</u> BA- 00047		
Location ID	<u>AD-005568</u>		
Sample Group	<u>Property</u>		
Location Description	<u>MP-1339.5</u>		
Category (circle)	<u>FS</u> FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- .45 <u>PCM- 0.8</u>	TEM- .45 PCM- 0.8	TEM- .45 PCM- 0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	<u>4095</u>		
Flow Meter ID No.	<u>JFB-65</u>		
Start Date	<u>9/24/08</u>		
Start Time	<u>0617</u>		
Start Flow (L/min)	<u>2.8</u>		
Stop Date	<u>9/24/08</u>		
Stop Time	<u>ML</u> <u>9/24/08</u> <u>1309</u>		
Stop Flow (L/min)	<u>2.7</u> <u>2.8</u>		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>NA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: <u>7198170164</u>			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO) _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

 For Field Team Completion
 (Provide Initials)
Completed by ML

QC by

DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 2 Page No: 19 Sampling Date: 9/24/08
 Address: BNSF-Row Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway (Other) ROW
 Sampling Team: CDM (Other) EMR Names: Matt Lenz
 Person Sampled/Co. Name: Karl Harms / BNSF SSN: 195 Task: Declipper machine operate

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00048		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP-1339.5		
Category (circle)	<u>(FS)</u> FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- .45 <u>PCM- 0.8</u>	TEM- .45 PCM- 0.8	TEM- .45 PCM- 0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	4091		
Flow Meter ID No.	UFB-65		
Start Date	9/24/08		
Start Time	0619		
Start Flow (L/min)	2.8		
Stop Date	9/24/08		
Stop Time	1359 1315		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	<u>(No)</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>NA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: <u>7198170164</u>			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO) _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

For Field Team Completion
(Provide Initials)

Completed by ML

QC by DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No: 2 Page No: 20 Sampling Date: 9/24/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other EMR Names: John Starr

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	<u>BA- 00055</u>	<u>BA- 00056</u>	<u>BA- 00057</u>
Location ID	<u>SP- 138459</u>	<u>AD-005568</u>	<u>AD-005568</u>
Sample Group	<u>Property</u>	<u>Blank</u>	<u>Blank</u>
Location Description	<u>MP-1339.5</u>	<u>MP-1339.5</u>	<u>MP-1339.5</u>
Category (circle)	<u>FS</u> FB-(field blank) LB-(lot blank) DB-(prep-dry blank)	<u>FS</u> <u>FB-(field blank)</u> LB-(lot blank) DB-(prep-dry blank)	<u>FS</u> <u>FB-(field blank)</u> LB-(lot blank) DB-(prep-dry blank)
Matrix Type (circle)	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> NA	Indoor <u>Outdoor</u> <u>NA</u>
Filter Diameter (circle)	<u>25mm</u> 37mm	<u>25mm</u> 37mm	<u>25mm</u> 37mm
Pore Size (circle)	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>	<u>TEM- .45</u> <u>PCM- 0.8</u>
GPS Status (circle)	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected-not required for sample	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample	<u>Collected</u> Previously Collected Not Collected-no signal (3 attempts) Not Collected- not required for sample
GPS File (fill in or circle)	Filename: <u>BNSF- ROW</u> NA	Filename: <u>NA</u>	Filename: <u>NA</u>
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	<u>Rotometer</u> DryCal NA	<u>Rotometer</u> DryCal NA
Pump ID Number	<u>8369</u>		
Flow Meter ID No.	<u>DFKS-1</u>		
Start Date	<u>9/24/08</u>		
Start Time	<u>0911</u>	<u>ML</u>	<u>ML</u>
Start Flow (L/min)	<u>7.6</u>	<u>9/24/08</u>	<u>7/24/08</u>
Stop Date	<u>9/24/08</u>		
Stop Time	<u>1246</u>		
Stop Flow (L/min)	<u>7.6</u>		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite? (circle)	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type (circle)	Pre Post Clear <u>2nd Clear</u> <u>3rd Clear</u> <u>NA</u>	Pre Post Clear <u>2nd Clear</u> <u>3rd Clear</u> NA	Pre Post Clear <u>2nd Clear</u> <u>3rd Clear</u> NA
Field Comments			
Cassette Lot Number: <u>7198170164</u>			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO): _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

For Field Team Completion (Provide Initials)

Completed by: MLQC by: DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 2 Page No: 21 Sampling Date: 9/25/08
 Address: BNSF ROW Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (ROW)
 Sampling Team: CDM Other EMR Names: Matt Lenz
 Person Sampled/Co. Name: Eric Pankuk / BNSF SSN: 0145 Task: Laborer

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	<u>ML</u> <u>9/25/08</u> BA- 00058		
Location ID	<u>AD-005568</u>		
Sample Group	<u>Property</u>		
Location Description	<u>MP-1341</u>		
Category (circle)	<u>FS</u> FS (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM-45 <u>PCM-0.8</u>	TEM-45 PCM-0.8	TEM-45 PCM-0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	<u>4091</u>		
Flow Meter ID No.	<u>JFB-65</u>		
Start Date	<u>9/25/08</u>		
Start Time	<u>0623</u>		
Start Flow (L/min)	<u>2.8</u>		
Stop Date	<u>9/25/08</u>		
Stop Time	<u>0925</u>		
Stop Flow (L/min)	<u>2.8</u>		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>NA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: <u>7198170164</u>			
Archive Blank (circle): Yes No	Yes No	Yes No	Yes No
Volpe:			
Entered (LFO)	Entered Validated	Entered Validated	Entered Validated

For Field Team Completion
(Provide Initials)

Completed by

ML

QC by

DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No. 2 Page No. 21 Sampling Date: 9/25/08
 Address: BNSF-ROW Owner/Tenant: BNSF
 Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (ROW)

Sampling Team: CDM Other EMR Names: Matt Lenz

Person Sampled/Co. Name: Dryce Vandenberg / BNSF SSN: 666 6225 Task: Scrap crane operator

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00059		
Location ID	AD-005568		
Sample Group	Property		
Location Description	HP-1341		
Category (circle)	<u>FS</u> FB (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- 45 <u>PCM- 0.8</u>	TEM- 45 PCM- 0.8	TEM- 45 PCM- 0.8
Flow Meter Type (circle)	<u>Rotometer</u> DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	4095		
Flow Meter ID No.	UFB-65		
Start Date	9/25/08		
Start Time	0625		
Start Flow (L/min)	2.8		
Stop Date	9/25/08		
Stop Time	0924		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	<u>No</u> Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No <u>Yes</u> NA	No Yes NA	No Yes NA
Sample Type	TWA EXC <u>NA</u>	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: 719817064			
Archive Blank (circle): Yes No	Yes No	Yes No	Yes No
Volpe:			
Entered (LFO) _____	Entered _____ Validated _____	Entered _____ Validated _____	Entered _____ Validated _____

For Field Team Completion
(Provide Initials)

Completed by ML

QC by DW

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: 2 Page No: 23 Sampling Date: 9/25/08
 Address: BNSF-Row Owner/Tenant: BNSF
 Business Name: NA
 Land Use: Residential School Commercial Mining Roadway Other (Row)
 Sampling Team: CDM Other EMR Names: MLL
 Person Sampled/Co. Name: 1 SSN: Task:

Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00069		
Location ID	<u>AD-005568</u>		
Sample Group	<u>Blank</u>		
Location Description	<u>Blank</u>		
Category (circle)	FS <u>FB</u> (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)	FS FB (field blank) LB (lot blank)
Matrix Type (circle)	Indoor <u>Outdoor</u>	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	<u>25mm</u> 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- 45 <u>PCM- 0.8</u>	TEM- 45 PCM- 0.8	TEM- 45 PCM- 0.8
Flow Meter Type (circle)	Rotometer DryCal <u>NA</u>	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number			
Flow Meter ID No.			
Start Date			
Start Time			
Start Flow (L/min)			
Stop Date			
Stop Time			
Stop Flow (L/min)			
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No Yes NA	No Yes NA	No Yes NA
Sample Type	TWA EXC NA	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: <u>714817064</u>			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO) <u> </u>	Volpe: Entered <u> </u> Validated <u> </u>	Volpe: Entered <u> </u> Validated <u> </u>	Volpe: Entered <u> </u> Validated <u> </u>

For Field Team Completion
(Provide Initials)

Completed by ML

QC by DW



APPENDIX D

FIELD CHANGE ORDERS

Field Change Order (FCO) #17-1

DATE: Wednesday, September 17, 2008

ADDRESS: BNSF ROW

PROJECT NAME: Libby Asbestos Project

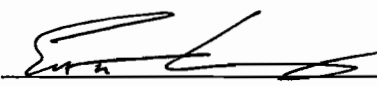
DESCRIPTION OF CHANGE AND RATIONALE

The flow rates on ABS monitors could not reach 5 L/min (most could reach 2.8 L/min) – had to reassess using higher sensitivity (0.0024 cc-1), instead of original target sensitivity of 0.001 cc-1).

The reduced flow rates led to extending the sampling period from 2 and 4 hr/event to 6 and 8 hr/event.

SIGNATURE APPROVALS

EPA MANAGEMENT: _____ DATE: _____

EMR MANAGEMENT:  _____ DATE: 9/17/08

Field Change Order (FCO) #17- 3

DATE: Wednesday, September 17, 2008

ADDRESS: BNSF ROW

PROJECT NAME: Libby Asbestos Project

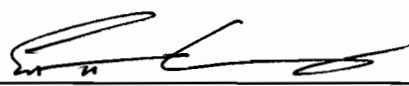
DESCRIPTION OF CHANGE AND RATIONALE

The SAP was written assuming that all train activity on both tracks (main and siding) would be halted during maintenance activities. However, Day 1 maintenance activity occurred on a track siding and after several hours into the maintenance activities, the main track opened to passing trains.

As a result, passing train activities were noted in the field logbook.

SIGNATURE APPROVALS

EPA MANAGEMENT: _____ DATE: _____

EMR MANAGEMENT:  _____ DATE: 9/17/08

Field Change Order (FCO) #17- 6

DATE: Wednesday, September 17, 2008

ADDRESS: BNSF ROW

PROJECT NAME: Libby Asbestos Project


DESCRIPTION OF CHANGE AND RATIONALE

Event duration for the worker is variable (up to 10 hr days) and not controlled by sampling design team. Sample team can only control turning on pumps in the morning (approximately 6:30 am) and picking pumps up at the end of the working day (late afternoon) – had to reassess flow rate as setting ABS worker pumps to 2.8 L/min for roughly 10 hour sampling event (6:30 am to 4:30 pm) yielded filter loading.

Reassessed flow rate for worker to avoid filter loading for next sampling event.

SIGNATURE APPROVALS

EPA MANAGEMENT: _____ DATE: _____

EMR MANAGEMENT:  _____ DATE: 9/17/08

Field Change Order (FCO) #18-2

DATE: Thursday, September 18, 2008

ADDRESS: BNSF ROW

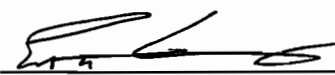
PROJECT NAME: Libby Asbestos Project

DESCRIPTION OF CHANGE AND RATIONALE

Reassessed flow rate for worker to avoid filter loading for sampling event due to previous day's filter loading. Set flow rate from 2.8 L/min to 1.0 L/min to see if loading would still be an issue.

SIGNATURE APPROVALS

EPA MANAGEMENT: _____ DATE: _____

EMR MANAGEMENT:  _____ DATE: 9/18/08

Field Change Order (FCO) #18-3

DATE: Thursday, September 18, 2008

ADDRESS: BNSF ROW


PROJECT NAME: Libby Asbestos Project

DESCRIPTION OF CHANGE AND RATIONALE

Note that sampling on Day 1 occurred in a very dry dusty location, with resulting filter loading on worker ABS samples; whereas, Day 2 sampling location was also dry, but significantly less dusty (probably due to minimal exposed soil, and no dirt access road alongside trackage).

SIGNATURE APPROVALS

EPA MANAGEMENT: _____ DATE: _____

EMR MANAGEMENT:  _____ DATE: 9/18/08

Field Change Order (FCO) #19-1

DATE: Friday, September 19, 2008

ADDRESS: BNSF ROW


PROJECT NAME: Libby Asbestos Project

DESCRIPTION OF CHANGE AND RATIONALE

Scheduled maintenance work was less than 1,000 feet in length. Therefore, worker ABS sampling period limited compared to Day 1 and Day 2 sampling. Modified sampling plan to suit shortened maintenance length and duration.

SIGNATURE APPROVALS

EPA MANAGEMENT: _____ DATE: _____

EMR MANAGEMENT:  _____ DATE: 9/19/08

Field Change Order (FCO) #22-1

DATE: Monday, September 22, 2008

ADDRESS: BNSF ROW

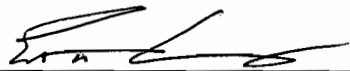
PROJECT NAME: Libby Asbestos Project

DESCRIPTION OF CHANGE AND RATIONALE

The SAP called for ABS sampling only during dry conditions, since it was based on EPA guidance. Sampling on this day event included light to heavy rain and was completed . Soil sampling, ABS and stationary air sampling was completed in otherwise normal fashion.

SIGNATURE APPROVALS

EPA MANAGEMENT: _____ DATE: _____

EMR MANAGEMENT:  _____ DATE: 9/22/08



APPENDIX E

WORKER AIR SAMPLE LABORATORIES REPORTS

EMSL Analytical, Inc.

107 Haddon Avenue

Westmont, New Jersey 08108

Phone: (856) 858-4800

Fax: (856) 858-9551

**LETTER OF TRANSMITTAL**

To:	Scott Carney	Date:	July 17, 2009
	EMR, Inc.	From:	Charles E. LaCerra
	11 East Superior Street	Re:	Libby, MT BNSF Work
	Suite 260		Mobile Lab Analytical Reports
	Duluth, MN 55802		See Below
	Phone: 763-277-5200		

We are sending you: **× Attached** **Under separate cover via**

<input type="checkbox"/> Solicitation	<input type="checkbox"/> Copy of Letter	<input type="checkbox"/> Invoice #'s See Below
<input type="checkbox"/> Subcontract	<input type="checkbox"/> As noted	<input type="checkbox"/> Other
<input type="checkbox"/> Laboratory Samples	<input checked="" type="checkbox"/> Analytical Reports	

These are transmitted as indicated below:

<input type="checkbox"/> Execute ___ Original(s)	<input type="checkbox"/> Review & Comment	<input type="checkbox"/> For Approval
<input type="checkbox"/> Return ___ Original(s)	<input type="checkbox"/> As Requested	<input type="checkbox"/> Respond as instructed
<input checked="" type="checkbox"/> For Your Information/File		<input type="checkbox"/> Other

Remarks:

Enclosed please find one (1) copy of the following mobile lab analytical reports for analysis for your review and use for the above referenced project:

270900045

Please feel free to contact me with any questions or if you require additional information

Copy to: _____

Signed: _____

INTERNAL CHAIN OF CUSTODY

4/14/2009 4:42:05 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID EMRI78
Customer PO:
Received: 04/14/09 4:11 PM

EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Test: TEM ISO 10312 Matrix Air TAT: 10 Days Qty: 14

Acct Sts: Slsprsn: epodell

Logged: jwyattpescador Date: 4/14/2009

Sample Condition: ☒ Acceptable
☐ Unacceptable

Comments

Inter-Lab Sample Transfer

Samples Relinquished: Date

Samples Received: Date

Package Mailed to Westmont: Date

Method of Delivery:

Includes: (Circle)

Benchsheets Sample Slides Sample filters
Micrographs GridBox Other

Final Package Received: Date:

Initial Prep (Initials/Lab): *EDMP* Date: 4/15/09
Filter Prep (Initials/Lab): *EDMP* Date: 4/15/09
Grid Prep (Initials/Lab): *EDMP* Date: 4/15/09

For Special Projects Use Only:

QC Selection: Date:
Date Package Review: *KL* Date: 7-15-09
Date Package Mailed: *OL* Date: 7/17/09

Special Instructions

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	\270900045-0001 A	BA-00001	(50mb), OL- Loose Debris in Cool	4/24/2009 4:11:00 PM
270900045	\270900045-0002 B	BA-00002	(25mb), OL- Loose Debris In Cool	4/24/2009 4:11:00 PM
270900045	\270900045-0003 C	BA-00011		4/24/2009 4:11:00 PM
270900045	\270900045-0004 D	BA-00012		4/24/2009 4:11:00 PM
270900045	\270900045-0005 E	BA-00021	(RS)	4/24/2009 4:11:00 PM
270900045	\270900045-0006 F	BA-00022		4/24/2009 4:11:00 PM
270900045	\270900045-0007 G	BA-00029		4/24/2009 4:11:00 PM
270900045	\270900045-0008 H	BA-00030		4/24/2009 4:11:00 PM

LB, RD, RS

2709-BNS-38 (A-G), (R)

EMSL Analytical, Inc., 107 West 4th Street, Libby, MT 59923

INTERNAL CHAIN OF CUSTODY

4/14/2009 4:42:05 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337

Phone: (218) 625-2332

Project: L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

270900045	270900045-0009 <i>e</i> BA-00037 (25ml), DL-Loose Debris in Cool	4/24/2009 4:11:00 PM
270900045	270900045-0010 <i>j</i> BA-00038 (50ml), DL-Loose Debris in Cool	4/24/2009 4:11:00 PM
270900045	270900045-0011 <i>k</i> BA-00047 (R.D.)	4/24/2009 4:11:00 PM
270900045	270900045-0012 <i>l</i> BA-00048	4/24/2009 4:11:00 PM
270900045	270900045-0013 <i>m</i> BA-00058	4/24/2009 4:11:00 PM
270900045	270900045-0014 <i>n</i> BA-00059	4/24/2009 4:11:00 PM

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:23 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78
Customer PO:
Received: 04/14/09 4:11 PM
EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Test: TEM ISO 10312

Matrix: Air

TAT: 10 Days

Qty: 14

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0001	BA-00001		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RMD</i>	Date:	4/16/09
Preliminary Data Sent to Special Projects:	<i>RKM</i>	Date:	4/17/09
Data Entry:	<i>de</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/24/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:23 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0002	BA-00002		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RMV</i>	Date:	4/16/09
Preliminary Data Sent to Special Projects:	<i>RKm</i>	Date:	4/17/09
Data Entry:	<i>OL</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/21/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0003	BA-00011		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RM</i>	Date:	4/16/09
Preliminary Data Sent to Special Projects:	<i>Rkm</i>	Date:	4/17/09
Data Entry:	<i>SC</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/24/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0004	BA-00012		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RM</i>	Date:	4/16/09
Preliminary Data Sent to Special Projects:	<i>RM</i>	Date:	4/17/09
Data Entry:	<i>SL</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/21/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0005	BA-00021		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>MS</i>	Date:	4/16/09
Preliminary Data Sent to Special Projects:	<i>RKm</i>	Date:	9/12/09
Data Entry:	<i>SL</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/24/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78
Customer PO:
Received: 04/14/09 4:11 PM

EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0006	BA-00022		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>PMJ</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>RKm</i>	Date:	4/17/09
Data Entry:	<i>el</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/24/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78
Customer PO:
Received: 04/14/09 4:11 PM

EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0007	BA-00029		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RMJ</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>Rkm</i>	Date:	4/17/09
Data Entry:	<i>OL</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/24/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micromgraph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMR178
Customer PO:
Received: 04/14/09 4:11 PM

EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0008	BA-00030		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>MSY</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>RKm</i>	Date:	4/17/09
Data Entry:	<i>cu</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TR</i>	Date:	4/24/09
Reported to Client:	<i>TR</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0009	BA-00037		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>pkj</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>Rkm</i>	Date:	4/17/09
Data Entry:	<i>ee</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/24/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78
Customer PO:
Received: 04/14/09 4:11 PM

EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0010	BA-00038		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>pm</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>Rkm</i>	Date:	4/17/09
Data Entry:	<i>sl</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/21/09
Reported to Client:	<i>TP</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78
Customer PO:
Received: 04/14/09 4:11 PM

EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0011	BA-00047		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>PMY</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>RKm</i>	Date:	4/17/09
Data Entry:	<i>EL</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TR</i>	Date:	4/24/09
Reported to Client:	<i>TR</i>	Date:	4/22/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984
Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78
Customer PO:
Received: 04/14/09 4:11 PM

EMSL Order: 270900045
EMSL Proj ID: BNSF Libby, MT 2008
Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0012	BA-00048		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RM</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>Rkm</i>	Date:	4/17/09
Data Entry:	<i>SL</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TR</i>	Date:	4/24/09
Reported to Client:	<i>TR</i>	Date:	4/22/09

Micrographs:

Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0013	BA-00058		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RPV</i>	Date:	<i>4/17/09</i>
Preliminary Data Sent to Special Projects:	<i>R/cm</i>	Date:	<i>4/12/09</i>
Data Entry:	<i>ec</i>	Date:	<i>4/20/09</i>
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	<i>4/21/09</i>
Reported to Client:	<i>TP</i>	Date:	<i>4/22/09</i>

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

INTERNAL SAMPLE CHAIN OF CUSTODY

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn: Scott Carney
EMR, Inc.
11 East Superior Street
Suite 260
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID: EMRI78

Customer PO:

Received: 04/14/09 4:11 PM

EMSL Order: 270900045

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0014	BA-00059		4/24/2009 4:11:00 PM

Comments:

ANALYZED:	<i>RM</i>	Date:	4/17/09
Preliminary Data Sent to Special Projects:	<i>RKm</i>	Date:	4/17/09
Data Entry:	<i>cu</i>	Date:	4/20/09
Structure Review:		Date:	
Data Validation:	<i>TP</i>	Date:	4/24/09
Reported to Client:	<i>TP</i>	Date:	4/24/09

Micrographs:

	Micrograph Number	Type Diffraction or Morphology

TEM Air
(Circle One)

TEM Dust

PCM

Indirect Preparation Record

EFA 360 (mm2)

INDIRECT PREPARATION RECORD

REVISION 1

FEBRUARY 9, 2009

		Indirect without ashing			Dilution Filtration						Indirect with Ashing			OK to Prep to Grid?
Prepped by:	Date:	Fraction of filter used	1st Resuspend Volume	Volume applied to filter	Volume of 1st Resuspend used	2nd Re-suspend Volume	Volume applied to filter	Volume of 2nd Re-suspend used	3rd Re-suspend Volume	Volume applied to filter	Fraction of filter ashed	Volume used to resuspend residue	Volume applied to 2nd filter	
Order ID	Sample #		mL	mL	mL	mL	mL	mL	mL	mL		mL	mL	Y/N
270900045	BA00001										1/2	100	10	
													15	
													25	
													50	Y
	BA00002										1/2	100	10	
													15	
													25	Y
													50	
	BA00037										1/2	100	10	
													15	
													25	Y
													50	
	BA00038										1/2	100	10	
													15	
													25	
													50	Y
	FilBlank										1/2	100	100	Y
	AshBlank											100	100	Y
	MB											100	100	Y

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Overloaded
 EPA Sample Number BA-00001
 QA Type Not QA
 Lab Sample Number 270900045-0001
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 0
 Number of Grid Openings (chrysotile) 0
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1344 L
 Sensitivity (amphibole) s/cc
 Sensitivity (chrysotile) s/cc
 Area Examined (amphibole) 0.000 mm2
 Area Examined (chrysotile) 0.000 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024	39	50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00001-270900045-0001-ISO_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Overloaded

EPA Sample Number:	BA-00001
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1344
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0001
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number	L14984

Analyzed by	
Analysis date	
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
10	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
10	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

COMMENTS

Overloaded

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00001_270900045-0001_ISO_D.xls

EPA SAMPLE ID:

BA-00001

LAB SAMPLE ID:

270900045-0001

Sample Type

Air

Count Rule

10312

Prep

Direct

QA Type

Not QA

ERROR CHECK

OK - No errors found

Data Entry by:

L.Ramowski

Data Entry date:

4/20/2009

QA by:

T. Peters

QA date:

4/21/2009

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00001
 QA Type Not QA
 Lab Sample Number 270900045-0001
 Sample Type Air
 Category Field
 Prep Indirect
 Counting Rules 10312

PARAMETERS

Effective filter area 360.0 mm²
 Indirect factor 2.50E-01
 Number of Grid Openings (amphibole) 39
 Number of Grid Openings (chrysotile) 39
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 1344 L
 Sensitivity (amphibole) 2.11E-03 s/cc
 Sensitivity (chrysotile) 2.11E-03 s/cc
 Area Examined (amphibole) 0.507 mm²
 Area Examined (chrysotile) 0.507 mm²

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00001_270900045-0001_ISO 04-16-09 I.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00001
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1344
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0001
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/16/2009
Prep	Indirect
If sample type = air, is there loose material or debris in the bowl?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, A
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>	
F- factor	0.25
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
35	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
35	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.25	F-factor
------	----------

Grid opening traverse direction:	V
----------------------------------	---

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00001_270900045-0001_ISO_04-16-09_l.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00001
270900045-0001

Sample Type	Air
Count Rule	10312

Prep	Indirect
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by: L.Ramowski

Data Entry date: 4/20/2009

QA by: T. Peters

QA date: 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

3	I7	ND
3	I9	ND
3	F6	ND
3	F8	ND

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Overloaded
 EPA Sample Number BA-00002
 QA Type Not QA
 Lab Sample Number 270900045-0002
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 0
 Number of Grid Openings (chrysotile) 0
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1333 L
 Sensitivity (amphibole) s/cc
 Sensitivity (chrysotile) s/cc
 Area Examined (amphibole) 0.000 mm2
 Area Examined (chrysotile) 0.000 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00002 270900045-0002 ISO D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Overloaded

EPA Sample Number:	BA-00002
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1333
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0002
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number	L14984

Analyzed by	
Analysis date	
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

COMMENTS

Overloaded

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
10	GOs required to reach target sensitivity
50	Maximum # of Structure
10	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00002_270900045-0002_ISO_D.xls

EPA SAMPLE ID:	BA-00002
LAB SAMPLE ID:	270900045-0002

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312
SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00002
 QA Type Not QA
 Lab Sample Number 270900045-0002
 Sample Type Air
 Category Field
 Prep Indirect
 Counting Rules 10312

PARAMETERS

Effective filter area 360.0 mm²
 Indirect factor 1.25E-01
 Number of Grid Openings (amphibole) 39
 Number of Grid Openings (chrysotile) 39
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 1333 L
 Sensitivity (amphibole) 4.26E-03 s/cc
 Sensitivity (chrysotile) 4.26E-03 s/cc
 Area Examined (amphibole) 0.507 mm²
 Area Examined (chrysotile) 0.507 mm²

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024	39	50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00002_270900045-0002_ISO_04-16-09_1.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00002
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1333
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0002
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/16/2009
Prep	Indirect
If sample type = air, is there loose material or debris in the container?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, B
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>	
F- factor	0.125
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
70	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
39	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

0.125 F-factor

Grid opening traverse direction: V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00002_270900045-0002_ISO_04-16-09_l.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00002
270900045-0002

Sample Type	Air
Count Rule	10312

Prep	Indirect
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

Maximum # of Grid Openings Reached-Complete current GO then stop.

[illegible]

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00011
 QA Type Not QA
 Lab Sample Number 270900045-0003
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 18
 Number of Grid Openings (chrysotile) 18
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 706 L
 Sensitivity (amphibole) 2.33E-03 s/cc
 Sensitivity (chrysotile) 2.33E-03 s/cc
 Area Examined (amphibole) 0.234 mm2
 Area Examined (chrysotile) 0.234 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00011_270900045-0003_ISO_04-16-09_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00011
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	706
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0003
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/16/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, C
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
18	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
18	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00011_270900045-0003_ISO_04-16-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00011
270900045-0003

Sample Type
Count Rule

Air
10312

Prep
QA Type

Direct
Not QA

ERROR CHECK

OK - No errors found

Data Entry by:

L.Ramowski

Data Entry date:

4/20/2009

QA by:

T. Peters

QA date:

4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312
SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00012
 QA Type Not QA
 Lab Sample Number 270900045-0004
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm²
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 18
 Number of Grid Openings (chrysotile) 18
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 687 L
 Sensitivity (amphibole) 2.39E-03 s/cc
 Sensitivity (chrysotile) 2.39E-03 s/cc
 Area Examined (amphibole) 0.234 mm²
 Area Examined (chrysotile) 0.234 mm²

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00012_270900045-0004_ISO_04-16-09_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00012
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	687
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0004
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/16/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, D
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
18	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
18	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00012_270900045-0004_ISO_04-16-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00012
270900045-0004

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by: L.Ramowski

Data Entry date: 4/20/2009

QA by: T.Peters

QA date: 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312
SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00021
 QA Type Not QA
 Lab Sample Number 270900045-0005
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 13
 Number of Grid Openings (chrysotile) 13
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 988 L
 Sensitivity (amphibole) 2.31E-03 s/cc
 Sensitivity (chrysotile) 2.31E-03 s/cc
 Area Examined (amphibole) 0.169 mm2
 Area Examined (chrysotile) 0.169 mm2

**Recording
Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping
Rules:**

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00021_270900045-0005_ISO_04-16-09_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00021
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	988
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0005
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/16/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, E
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
13	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
13	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00021_270900045-0005_ISO_04-16-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00021
270900045-0005

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by: L.Ramowski

Data Entry date: 4/20/2009

QA by: T. Peters

QA date: 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00022
 QA Type Not QA
 Lab Sample Number 270900045-0006
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 13
 Number of Grid Openings (chrysotile) 13
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1016 L
 Sensitivity (amphibole) 2.24E-03 s/cc
 Sensitivity (chrysotile) 2.24E-03 s/cc
 Area Examined (amphibole) 0.169 mm2
 Area Examined (chrysotile) 0.169 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00022_270900045-0006_ISO_04-17-09_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00022
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1016
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0006
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
if sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, F
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

$\geq 3:1$	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
13	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
13	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

COMMENTS

BA-00022_270900045-0006_ISO_04-17-09_D.xls

BA-00022

270900045-0006

Air

10312

Direct

Not QA

OK - No errors found

L.Ramowski

4/20/2009

T.Peters

4/21/2009

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00029
 QA Type Not QA
 Lab Sample Number 270900045-0007
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 11
 Number of Grid Openings (chrysotile) 11
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1145 L
 Sensitivity (amphibole) 2.35E-03 s/cc
 Sensitivity (chrysotile) 2.35E-03 s/cc
 Area Examined (amphibole) 0.143 mm2
 Area Examined (chrysotile) 0.143 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00029_270900045-0007_ISO_04-17-09_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00029
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1145
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0007
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, G
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
11	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
11	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00029_270900045-0007_ISO_04-17-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00029

270900045-0007

Sample Type
Count Rule

Air

10312

Prep
QA Type

Direct

Not QA

ERROR CHECK

OK - No errors found

Data Entry by:

L. Ramowski

Data Entry date:

4/20/2009

QA by:

T. Peters

QA date:

4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00030
 QA Type Not QA
 Lab Sample Number 270900045-0008
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 11
 Number of Grid Openings (chrysotile) 11
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1145 L
 Sensitivity (amphibole) 2.35E-03 s/cc
 Sensitivity (chrysotile) 2.35E-03 s/cc
 Area Examined (amphibole) 0.143 mm2
 Area Examined (chrysotile) 0.143 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00030_270900045-0008_ISO_04-17-09_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00030
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1145
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0008
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, H
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
11	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
11	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00030_270900045-0008_ISO_04-17-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00030
270900045-0008

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by: L.Ramowski

QA by: T. Peters

Data Entry date: 4/20/2009

QA date: 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Overloaded
 EPA Sample Number BA-00037
 QA Type Not QA
 Lab Sample Number 270900045-0009
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm²
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 0
 Number of Grid Openings (chrysotile) 0
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 739 L
 Sensitivity (amphibole) s/cc
 Sensitivity (chrysotile) s/cc
 Area Examined (amphibole) 0.000 mm²
 Area Examined (chrysotile) 0.000 mm²

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00037 270900045-0009 ISO D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Overloaded

EPA Sample Number:	BA-00037
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	739
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0009
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number	L14984

Analyzed by	
Analysis date	
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
17	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
17	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

COMMENTS

Overloaded

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00037_270900045-0009_ISO_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00037
270900045-0009

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312
SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00037
 QA Type Not QA
 Lab Sample Number 270900045-0009
 Sample Type Air
 Category Field
 Prep Indirect
 Counting Rules 10312

PARAMETERS

Effective filter area 360.0 mm²
 Indirect factor 1.25E-01
 Number of Grid Openings (amphibole) 39
 Number of Grid Openings (chrysotile) 39
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 739 L
 Sensitivity (amphibole) 7.69E-03 s/cc
 Sensitivity (chrysotile) 7.69E-03 s/cc
 Area Examined (amphibole) 0.507 mm²
 Area Examined (chrysotile) 0.507 mm²

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024	39	50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00037 270900045-0009 ISO 04-17-09 1.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00037
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	739
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0009
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Indirect
If sample type = air, is there loose material or debris in the bowl?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, I
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>	
F- factor	0.125
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
125	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
39	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
0.125	F-factor

Grid opening traverse direction:	V
----------------------------------	---

COMMENTS

--

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00037_270900045-0009_ISO_04-17-09_l.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00037
270900045-0009

Sample Type	Air
Count Rule	10312

Prep	Indirect
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

Maximum # of Grid Openings Reached-Complete current GO then stop.

[illegible]

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Overloaded
 EPA Sample Number BA-00038
 QA Type Not QA
 Lab Sample Number 270900045-0010
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm²
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 0
 Number of Grid Openings (chrysotile) 0
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 890 L
 Sensitivity (amphibole) s/cc
 Sensitivity (chrysotile) s/cc
 Area Examined (amphibole) 0.000 mm²
 Area Examined (chrysotile) 0.000 mm²

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00038_270900045-0010_ISO_D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Overloaded

EPA Sample Number:	BA-00038
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	890
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0010
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number	L14984

Analyzed by	
Analysis date	
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

COMMENTS

Overloaded

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
14	GOS required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structures
14	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00038_270900045-0010_ISO_D.xls

EPA SAMPLE ID:

BA-00038

LAB SAMPLE ID:

270900045-0010

Sample Type

Air

Count Rule

10312

Prep

Direct

QA Type

Not QA

ERROR CHECK

OK - No errors found

Data Entry by:

L. Ramowski

Data Entry date:

4/20/2009

QA by:

T. Peters

QA date:

4/21/2009

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00038
 QA Type Not QA
 Lab Sample Number 270900045-0010
 Sample Type Air
 Category Field
 Prep Indirect
 Counting Rules 10312

PARAMETERS

Effective filter area 360.0 mm²
 Indirect factor 2.50E-01
 Number of Grid Openings (amphibole) 39
 Number of Grid Openings (chrysotile) 39
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 890 L
 Sensitivity (amphibole) 3.19E-03 s/cc
 Sensitivity (chrysotile) 3.19E-03 s/cc
 Area Examined (amphibole) 0.507 mm²
 Area Examined (chrysotile) 0.507 mm²

**Recording
Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping
Rules:**

Target S	Max GOs	Max N
0.0024	39	50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00038 270900045-0010 ISO 04-17-09 I.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00038
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	890
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0010
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Indirect
If sample type = air, is there loose material or debris in the bowl?	Yes
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, J
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>	
F- factor	0.25
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
52	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
39	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.25 F-factor

Grid opening traverse direction:	V
----------------------------------	---

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00038_270900045-0010_ISO_04-17-09_I.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00038
270900045-0010

Sample Type	Air
Count Rule	10312

Prep	Indirect
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

Maximum # of Grid Openings Reached-Complete current GO then stop.

[illegible]

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312
SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00047
 QA Type Not QA
 Lab Sample Number 270900045-0011
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 11
 Number of Grid Openings (chrysotile) 11
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1154 L
 Sensitivity (amphibole) 2.33E-03 s/cc
 Sensitivity (chrysotile) 2.33E-03 s/cc
 Area Examined (amphibole) 0.143 mm2
 Area Examined (chrysotile) 0.143 mm2

**Recording
Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping
Rules:**

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00047_270900045-0011_ISO_04-17-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00047
270900045-0011

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00048
 QA Type Not QA
 Lab Sample Number 270900045-0012
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm²
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 11
 Number of Grid Openings (chrysotile) 11
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 1165 L
 Sensitivity (amphibole) 2.31E-03 s/cc
 Sensitivity (chrysotile) 2.31E-03 s/cc
 Area Examined (amphibole) 0.143 mm²
 Area Examined (chrysotile) 0.143 mm²

**Recording
Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping
Rules:**

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00048 270900045-0012 ISO 04-17-09 D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00048
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1165
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0012
Number of grids prepared	5
Prepared by	E.Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
if sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, L
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
11	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
11	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

	F-factor
--	----------

Grid opening traverse direction:	V
----------------------------------	---

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00048_270900045-0012_ISO_04-17-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00048
270900045-0012

Sample Type
Count Rule

Air
10312

Prep
QA Type

Direct
Not QA

ERROR CHECK

OK - No errors found

Data Entry by:

L.Ramowski

QA by:

T.Peters

Data Entry date:

4/20/2009

QA date:

4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312
SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00058
 QA Type Not QA
 Lab Sample Number 270900045-0013
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 25
 Number of Grid Openings (chrysotile) 25
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 510 L
 Sensitivity (amphibole) 2.32E-03 s/cc
 Sensitivity (chrysotile) 2.32E-03 s/cc
 Area Examined (amphibole) 0.325 mm2
 Area Examined (chrysotile) 0.325 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00058 270900045-0013 ISO 04-17-09 D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00058
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	510
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0013
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, M
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
25	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
25	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00058_270900045-0013_ISO_04-17-09_D.xls

EPA SAMPLE ID:

BA-00058

LAB SAMPLE ID:

270900045-0013

Sample Type

Air

Count Rule

10312

Prep

Direct

QA Type

Not QA

ERROR CHECK

OK - No errors found

Data Entry by:

L.Ramowski

Data Entry date:

4/20/2009

QA by:

T. Peters

QA date:

4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00059
 QA Type Not QA
 Lab Sample Number 270900045-0014
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 25
 Number of Grid Openings (chrysotile) 25
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 501 L
 Sensitivity (amphibole) 2.36E-03 s/cc
 Sensitivity (chrysotile) 2.36E-03 s/cc
 Area Examined (amphibole) 0.325 mm2
 Area Examined (chrysotile) 0.325 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00059 270900045-0014 ISO 04-17-09 D.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00059
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	501
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0014
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, N
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
25	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
25	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00059_270900045-0014_ISO_04-17-09_D.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00059
270900045-0014

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

Target Sensitivity Reached-Complete current GO, then stop

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
EPA Sample Number 0
QA Type LB
Lab Sample Number 270900045
Sample Type Air
Category Blank
Prep Indirect
Counting Rules 10312

PARAMETERS

Effective filter area 360.0 mm2
Indirect factor 1.00E+00
Number of Grid Openings (amphibole) 10
Number of Grid Openings (chrysotile) 10
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 0 L
Sensitivity (amphibole) Blank s/cc
Sensitivity (chrysotile) Blank s/cc
Area Examined (amphibole) 0.130 mm2
Area Examined (chrysotile) 0.130 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
	10	50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a					
b					
c					
d					
e					
f					
Total					<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 270900045_ISO_04-17-09_ILB.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Blank
Filter Status	Analyzed

EPA Sample Number:	
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	
Date received by lab	
Lab Job Number:	270900045
Lab Sample Number:	270900045
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Indirect
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, O
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>	
F-factor	1
QA Type	Lab Blank

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

	Target Sensitivity
10	GOs required to reach target sensitivity
10	Maximum # of GOs
50	Maximum # of Structures
10	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

1	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
100	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

1 F-factor

Grid opening traverse direction:

V

COMMENTS

_270900045_ISO_04-17-09_ILB.xls

ERROR CHECK
OK - No errors found

QA by:	T. Peters
QA date:	4/21/2009

[illegible]



BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00021
 QA Type RS
 Lab Sample Number 270900045-0005
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 13
 Number of Grid Openings (chrysotile) 13
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 988 L
 Sensitivity (amphibole) 2.31E-03 s/cc
 Sensitivity (chrysotile) 2.31E-03 s/cc
 Area Examined (amphibole) 0.169 mm2
 Area Examined (chrysotile) 0.169 mm2

**Recording
Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping
Rules:**

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00021_270900045-0005_ISO_04-17-09_DRS.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00021
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	988
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0005
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, E
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Recount Same

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
13	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structures
13	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00021_270900045-0005_ISO_04-17-09_DRS.xls

EPA SAMPLE ID:
LAB SAMPLE ID:

BA-00021
270900045-0005

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	RS

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count -- ISO 10312

SAMPLE ID

Status Analyzed
 EPA Sample Number BA-00047
 QA Type RD
 Lab Sample Number 270900045-0011
 Sample Type Air
 Category Field
 Prep Direct
 Counting Rules 10312

PARAMETERS

Effective filter area 385.0 mm2
 Indirect factor 1.00E+00
 Number of Grid Openings (amphibole) 11
 Number of Grid Openings (chrysotile) 11
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1154 L
 Sensitivity (amphibole) 2.33E-03 s/cc
 Sensitivity (chrysotile) 2.33E-03 s/cc
 Area Examined (amphibole) 0.143 mm2
 Area Examined (chrysotile) 0.143 mm2

Recording
Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
 Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00047_270900045-0011_ISO_04-17-09_DRD.xls

FILE TYPE: Original

BNSF 2008 Libby Site Investigation v33

TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	OL 100 CX II (27-2)
Voltage (KV)	100kv
Magnification	19,000x
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	BA-00047
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1154
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0011
Number of grids prepared	5
Prepared by	E.Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number	L14984

Analyzed by	E.Wyatt-Pescador
Analysis date	4/17/2009
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, K
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Recount Different

Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

Stopping Rules:

0.00240	Target Sensitivity
11	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
11	Estimated # of GOs

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

COMMENTS

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

BA-00047_270900045-0011_ISO_04-17-09_DRD.xls

EPA SAMPLE ID:	BA-00047
LAB SAMPLE ID:	270900045-0011

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	RD

ERROR CHECK

OK - No errors found

Data Entry by:	L.Ramowski
Data Entry date:	4/20/2009

QA by:	T. Peters
QA date:	4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00001
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1344
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0001
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	9 L14584
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cow? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Recording Rules:

Minimum Aspect Ratio (circle one):

none $\geq 3:1$ $\geq 5:1$

Minimum Length (μm): 0.5

Minimum Width (μm): None

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0024
Max # of GOs:	10
Target # of Structures:	50

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right---->

[illegible]

F-factor Calculation:

Indirect Prep Inputs	
	Fraction of primary filter used for indirect prep or ashing <i>[For dust and dustfall, enter 1.0]</i>
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H	Horizontal
---	------------

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	FMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00001
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1344
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0001
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 114684 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/16/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	I
If sample type = air, Is there loose material or debris in the cow? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, A
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right —>

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity	0.0024
Max # of GOs:	39 R1 4/17
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J6	ND														
	J8	ND														
	J10	ND														
	I7	ND														
	H2	ND														
	H6	ND														
	H8	ND														
	H10	ND														
	G1	ND														
✓	G3	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V VerticalAre prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

2709-BNS-38, A

[illegible]

2709-BNS-38, A

[illegible]

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00002
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1333
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0002
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	9 L14584 4/20/09
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	
Target # of Structures:	50

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
		- OVERLOADED -														

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 DX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00002
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1333
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0002
Number of grids prepared	5
Prepared by	E. Wyatt Pescador
Preparation date	4/15/2009
EPA COC Number:	L14784 9 4/15/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/16/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	I
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, B
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—>

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	39
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J2	ND														
	J4	ND														
	J6	ND														
	J8	ND														
	I3	ND														
	I5	ND														
	I7	ND														
	H2	ND														
	H4	ND														
	H6	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

☒ V VerticalAre prepped grids acceptable for analysis? (circle one) ☒ Yes ☐ No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

EMSL27

BA-00002

LAB JOB NUMBER

270900045

270900045-0002

A

Not QA

GRID STORAGE LOC.

2709-BNS-38, B

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

LAB NAME	EMSL27	EPA SAMPLE NO.	BA-00002	QA TYPE	Not QA	LAB JOB NUMBER	270900045
LAB SAMPLE NO.	270900045-0002	SAMPLE TYPE	A			GRID STORAGE LOC.	2709-BNS-38. B

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	J2	ND														
	J4	ND														
	J6	ND														
	J8	ND														
	J10	ND														
	J11	ND														
	J13	ND														
	J15	ND														
	J17	ND														
	J19	ND														
	H2	ND														
	H4	ND														
	H6	ND														
	H8	ND														

2/1/09

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00011
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	706
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0003
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14584 147/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/16/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	NO 147/17/09
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, C
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	18
Target # of Structures:	50

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—>

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J1	ND														
	J3	ND														
	J5	ND														
	J7	ND														
	J9	ND														
	I2	ND														
	I4	ND														
	I6	ND														
	G2	ND														
	G4	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

2709-BNS-38, C

[Signature] 4/16/09

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00012
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	687
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0004
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 L14584 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/16/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	NO Yes 4/17/09
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, D
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—>

Recording Rules:		
Minimum Aspect Ratio (circle one):		
none	≥ 3:1	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	18
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J2	ND														
	J4	ND														
	J6	ND														
	J8	ND														
	F2	ND														
	F4	ND														
	F6	ND														
	F8	ND														
	F10	ND														
2	J2	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
☒ V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LAB NAME	EMSL27	EPA SAMPLE NO.	BA-00012	QA TYPE	LAB JOB NUMBER	270900045
LAB SAMPLE NO.	270900045-0004	SAMPLE TYPE	A	Not QA	GRID STORAGE LOC.	2709-BNS-38, D

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	I4	ND														
1	I6	ND														
	I8	ND														
	I10	ND														
	E1	ND														
	E3	ND														
	E5	ND														
4	E7	ND														
Redundant																

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00021
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	988
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0005
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14784
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/16/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	NO
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, E
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:		
Minimum Aspect Ratio (circle one):		
none	≥ 3:1	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	13
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J5	ND														
	J7	ND														
	J9	ND														
	H7	ND														
	H9	ND														
	D7	ND														
	D9	ND														
2	G1	ND														
	G3	ND														
	G5	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H
Horizontal
V
Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

LAB NAME

EMSL27

EPA SAMPLE NO.

BA-00021

QA TYPE

LAB JOB NUMBER

270900045

LAB SAMPLE NO.

270900045-0005

SAMPLE TYPE

A

Not QA

GRID STORAGE LOC. |

2709-BNS-38, E

[illegible]

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00022
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1016
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0006
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14384
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	ND Yes 4/17/09
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, F
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	13
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	I8	ND														
1	H9	ND														
	F7	ND														
	D5	ND														
	D7	ND														
	C8	ND														
→	C10	ND														
2	H1	ND														
1	H3	ND														
→	H5	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for Indirect prep or ashing (For dust and dustfall, enter 1.0)
First resuspension volume or rinse volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution
Third resuspension volume (mL)
Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing
--

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00029
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1145
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0007
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 L14384 4/15/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No Yes 4/17/09
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, G
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	11
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J3	ND														
	J5	ND														
	J7	ND														
	J9	ND														
	C7	ND														
	C9	ND														
2	J6	ND														
	J8	ND														
	J10	ND														
	D7	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-Factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for Indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

LAB NAME

EMSL27

EPA SAMPLE NO.

BA-00029

QA TYPE

LAB JOB NUMBER:

270900045

LAB SAMPLE NO.

270900045-0007

SAMPLE TYPE

A

Not QA

GRID STORAGE LOC. [

2709-BNS-38, G

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00030
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1145
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0008
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 L14584: 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	ND yes 4/17/09
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, H
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3.1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	11
Target # of Structures:	50

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	F2	ND														
	F4	ND														
	F6	ND														
	F8	ND														
	F10	ND														
	D6	ND														
	D8	ND														
2	F1	ND														
	F3	ND														
	F5	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V VerticalAre prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

LAB NAME	EMSL27	EPA SAMPLE NO.	BA-00030	QA TYPE	LAB JOB NUMBER	270900045
LAB SAMPLE NO.	270900045-0008	SAMPLE TYPE	A	Not QA	GRID STORAGE LOC.	2709-BNS-38, H

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00037
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	739
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0009
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	9 11 L14684 4
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):

none	<u>$\geq 3:1$</u>	$\geq 5:1$
------	------------------------------	------------

Minimum Length (μm):

0.5

Minimum Width (μm):

None

<u>Stopping Rules:</u>	
Target Sensitivity	0.0024
Max # of GOs	17
Target # of Structures	50

[illegible]

F-factor Calculation:

Indirect Prep Inputs	
	Fraction of primary filter used for indirect prep or ashing <i>[For dust and dustfall, enter 1.0]</i>
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing	Concentration of Fe^{3+} in the filtrate, $\mu\text{g/L}$
0.0	100
0.1	100
0.2	100
0.3	100
0.4	100
0.5	100
0.6	100
0.7	100
0.8	100
0.9	100
1.0	100

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00037
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	739
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0009
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14384 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	DI 4/17/09
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, I
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>3</u> $\geq 5:1$
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	39
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J1	ND														
	J3	ND														
	J5	ND														
	J7	ND														
	J9	ND														
	I2	ND														
	I4	ND														
	I6	ND														
	I8	ND														
	I10	ND														

F-factor Calculation:

Indirect Prep Inputs

<u>0.5</u>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<u>100</u>	First resuspension volume or rinsate volume (mL)
<u>25</u>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

EMSL27

BA-00037

QA TYPE

LAB JOB NUMBER

270900045

270900045-0009

SAMPLE TYPE

A

Not QA

GRID STORAGE LOC.

2709-BNS-38, 1

[illegible]

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00038
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	890
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0010
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	9 L14884
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cow? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):

none $\geq 3:1$ $\approx 5:1$

Minimum Length (μm): 0.5

Minimum Width (μm): None

Stopping Rules	
Target Sensitivity:	0.0024
Max # of GOs:	14
Target # of Structures:	50

[illegible]

F-factor Calculation:

Indirect Prep Inputs	
	Fraction of primary filter used for Indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinse volume (mL.)
	Volume applied to secondary filter (mL.) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing	0.0	0.2	0.4	0.6	0.8	1.0
0.0	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00
0.6	0.00	0.00	0.00	0.00	0.00	0.00
0.8	0.00	0.00	0.00	0.00	0.00	0.00
1.0	0.00	0.00	0.00	0.00	0.00	0.00

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00038
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	890
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0010
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14384 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	I
If sample type = air, is there loose material or debris in the cow? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, J
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um): 0.5

Minimum Width (um): None

Stopping Rules:

Target Sensitivity: 0.0024

Max # of GOs: 39

Target # of Structures: 50

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J4	ND														
	J6	ND														
	J8	ND														
	J10	ND														
	I1	ND														
	I5	ND														
	I7	ND														
	I9	ND														
	H4	ND														
	H6	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V VerticalAre prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

2709-BNS-38, J

[illegible]

2709-BNS-38, J

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00047
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1154
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0011
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14384
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, K
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	11
Target # of Structures:	50

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J1	ND														
	J3	ND														
	J5	ND														
	J7	ND														
	J9	ND														
	D7	ND														
2	G4	ND														
	G6	ND														
	G8	ND														
	D8	ND														

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
☒ V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

2709-BNS-38. K

[illegible]

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00048
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1165
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0012
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14384
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, L
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Recording Rules:

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um): 0.5

Minimum Width (um): None

Stopping Rules:

Target Sensitivity: 0.0024

Max # of GOs: 11

Target # of Structures: 50

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	I2	ND														
	I4	ND														
	I6	ND														
	I8	ND														
	I10	ND														
	E7	ND														
	E9	ND														
2	G1	ND														
	G3	ND														
	G5	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
 V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

LAB NAME

EMSL27

EPA SAMPLE NO.

BA-00048

QA TYPE

LAB JOB NUMBER:

270900045

LAB SAMPLE NO.

270900045-0012

SAMPLE TYPE

A

Not QA

GRID STORAGE LOC.

2709-BNS-38, L

[illegible]

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	366
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00058
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	510
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0013
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 L14984 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	NO Yes 4/17/09
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, M
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0024
Max # of GOs:	25
Target # of Structures:	50

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J1	ND														
	J3	ND														
	J5	ND														
	J7	ND														
	J9	ND														
	I2	ND														
	I4	ND														
	I6	NP														
	I10	ND														
	H1	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

EMSL27

BA-00058

LAB JOB NUMBER

270900045

270900045-0013

A

Not QA

GRID STORAGE LOC.

2709-BNS-38, M

[illegible]

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00059
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	501
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0014
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14584 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	NO yes 4/17/09
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, N
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	25
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J2	ND														
	J4	ND														
	J6	ND														
	J8	ND														
	J10	ND														
	I1	ND														
	I3	ND														
	I5	ND														
	I7	ND														
	I9	ND														

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
☒ V Vertical

Are prepped grids acceptable for analysis? (circle one) yes No

If No, explain:

2709-BNS-38, N

[illegible]

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

LB

Laboratory name:	EMSL27
Instrument	JEOL-100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Blank
Primary filter pore size (um)	0.8

EPA Sample Number:	
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	
Date received by lab	
Lab Job Number:	270900045
Lab Sample Number:	270900045
Number of grids prepared	3
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 L14884 4/17/09
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	I
If sample type = air, is there loose material or debris in the cow? (Yes, No)	
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, O
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Lab Blank Not QA any 4/17/09

Recording Rules:		
Minimum Aspect Ratio (circle one):		
none	<u>≥ 3:1</u>	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

Stopping Rules:	
Target Sensitivity	
Max # of GOs:	10
Target # of Structures:	50

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	I1	ND														
	I3	ND														
	I5	ND														
	I7	ND														
	I9	ND														
2	G2	ND														
	G4	ND														
	G6	ND														
	G8	ND														
	G10	ND														

F-factor Calculation:	
Indirect Prep Inputs	
<u>1.0</u>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<u>100</u>	First resuspension volume or rinsate volume (mL)
<u>100</u>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions	
	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter	
	Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole C = Chrysotile NAM = Non-asbestos material

Grid opening traverse direction (circle one):
H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

**BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count**

Page 1 of 2

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00021
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	988
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0005
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	L14784 ⁹ _{4/17/09}
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, E
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Recount Same

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:		
Minimum Aspect Ratio (circle one):		
none	≥ 3:1	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	13
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J5	ND														
	J7	ND														
	J9	ND														
	H7	ND														
	H9	ND														
	D7	ND														
	D9	ND														
2	G1	ND														
	G3	ND														
	G5	ND														

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

BNSF 2008 Libby Site Investigation v33
TEM Asbestos Structure Count

LAB NAME	EMSL27	EPA SAMPLE NO.	BA-00021	QA TYPE	LAB JOB NUMBER	270900045
LAB SAMPLE NO.	270900045-0005	SAMPLE TYPE	A	Recount Same	GRID STORAGE LOC.	2709-BNS-38, E

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	G7	ND														
↓	C8	ND														
	C10	ND														
<div style="position: relative; height: 400px;"> <div style="position: absolute; top: 0; left: 0; width: 100%; height: 100%; border-left: 2px solid black; border-bottom: 2px solid black;"></div> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%) rotate(-45deg);"> 4/11/04 </div> </div>																

2709-BNS-38, K

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	D10	ND														
END 4/12/09																

Chain of Custody Record

Libby Asbestos Investigation

No. L14984

From: CDM

60 Port Blvd, Ste. 200

Libby, MT 59923

U.S. Environmental Protection Agency, Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Send to: EMSL-Mobile Lab

107 W 4th St

Libby, MT 59923

via: ☒ hand delivery ☐ shipped

Date Shipped: 4/14/2009

Carrier Name: Hand-delivered

Airbill: NA

270900045

Sample Placed in Cooler/Bag	Index ID	Suffix ID	Sample Date	Sample Media (S=Soil; W=Water; D=Dust; A=Air; B=Bulk Insulation)	Volume (L) or Area (cm2)	Filter Pore Size (um)	Turn Around Time	Analysis Request	Comments	Sample Received by Lab
<input checked="" type="checkbox"/>	BA-00001		9/17/2008	A	1344 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00002		9/17/2008	A	1333 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00011		9/18/2008	A	706 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00012		9/18/2008	A	687 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00021		9/19/2008	A	988 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00022		9/19/2008	A	1016 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00029		9/22/2008	A	1145 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00030		9/22/2008	A	1145 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00037		9/23/2008	A	739 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00038		9/23/2008	A	890 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00047		9/24/2008	A	1154 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00048		9/24/2008	A	1165 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00058		9/25/2008	A	510 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	BA-00059		9/25/2008	A	501 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	<input checked="" type="checkbox"/>

Total Number of Samples 14

END OF SUBMITTAL

Additional Comments:

Please see attachment

<i>[Signature]</i> CDM	4-14-09 1611	<i>[Signature]</i> J. Whatt Perceada/EMSL	4/14/09/1611	OK & accept
Relinquished by (Signature and Company)	Date/Time	Received by (Signature and Company)	Date/Time	Sample Condition upon Receipt
<i>[Signature]</i> J. Whatt-Perceada/EMSL	6/8/09/1255			
Relinquished by (Signature and Company)	Date/Time	Received by (Signature and Company)	Date/Time	Sample Condition upon Receipt
Relinquished by (Signature and Company)	Date/Time	Received by (Signature and Company)	Date/Time	Sample Condition upon Receipt